

ArcTanh

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Notations

Traditional name

Inverse hyperbolic tangent

Traditional notation

$\tanh^{-1}(z)$

Mathematica StandardForm notation

ArcTanh[z]

Primary definition

01.27.02.0001.01

$$\tanh^{-1}(z) = \frac{1}{2} (\log(1+z) - \log(1-z))$$

The function $\tanh^{-1}(z)$ can also be defined as the inverse function of \tanh : $w = \tanh^{-1}(z)$ if and only if $\tanh(w) = z$.

Specific values

Values at fixed points

01.27.03.0001.01

$$\tanh^{-1}(0) = 0$$

01.27.03.0002.01

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

01.27.03.0003.01

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

01.27.03.0004.01

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

$$\text{01.27.03.0005.01} \\ \tanh^{-1}\left(-i\sqrt{1-\frac{2}{\sqrt{5}}}\right) = -\frac{\pi i}{10}$$

$$\text{01.27.03.0006.01} \\ \tanh^{-1}\left(i(\sqrt{2}-1)\right) = \frac{\pi i}{8}$$

$$\text{01.27.03.0007.01} \\ \tanh^{-1}\left(i(1-\sqrt{2})\right) = -\frac{\pi i}{8}$$

$$\text{01.27.03.0008.01} \\ \tanh^{-1}\left(\frac{i}{\sqrt{3}}\right) = \frac{\pi i}{6}$$

$$\text{01.27.03.0009.01} \\ \tanh^{-1}\left(-\frac{i}{\sqrt{3}}\right) = -\frac{\pi i}{6}$$

$$\text{01.27.03.0010.01} \\ \tanh^{-1}\left(i\sqrt{5-2\sqrt{5}}\right) = \frac{\pi i}{5}$$

$$\text{01.27.03.0011.01} \\ \tanh^{-1}\left(-i\sqrt{5-2\sqrt{5}}\right) = -\frac{\pi i}{5}$$

$$\text{01.27.03.0012.01} \\ \tanh^{-1}(i) = \frac{\pi i}{4}$$

$$\text{01.27.03.0013.01} \\ \tanh^{-1}(-i) = -\frac{\pi i}{4}$$

$$\text{01.27.03.0014.01} \\ \tanh^{-1}\left(i\sqrt{1+\frac{2}{\sqrt{5}}}\right) = \frac{3\pi i}{10}$$

$$\text{01.27.03.0015.01} \\ \tanh^{-1}\left(-i\sqrt{1+\frac{2}{\sqrt{5}}}\right) = -\frac{3\pi i}{10}$$

$$\text{01.27.03.0016.01} \\ \tanh^{-1}(i\sqrt{3}) = \frac{\pi i}{3}$$

$$\text{01.27.03.0017.01} \\ \tanh^{-1}(-i\sqrt{3}) = -\frac{\pi i}{3}$$

01.27.03.0018.01

$$\tanh^{-1}\left(i(1 + \sqrt{2})\right) = \frac{3\pi i}{8}$$

01.27.03.0019.01

$$\tanh^{-1}\left(-i(1 + \sqrt{2})\right) = -\frac{3\pi i}{8}$$

01.27.03.0020.01

$$\tanh^{-1}\left(i\sqrt{5 + 2\sqrt{5}}\right) = \frac{2\pi i}{5}$$

01.27.03.0021.01

$$\tanh^{-1}\left(-i\sqrt{5 + 2\sqrt{5}}\right) = -\frac{2\pi i}{5}$$

01.27.03.0022.01

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

01.27.03.0023.01

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

01.27.03.0024.01

$$\tanh^{-1}(1) = \infty$$

01.27.03.0025.01

$$\tanh^{-1}(-1) = -\infty$$

Values at infinities

01.27.03.0026.01

$$\tanh^{-1}(\infty) = -\frac{i\pi}{2}$$

01.27.03.0027.01

$$\tanh^{-1}(-\infty) = \frac{i\pi}{2}$$

01.27.03.0028.01

$$\tanh^{-1}(i\infty) = \frac{i\pi}{2}$$

01.27.03.0029.01

$$\tanh^{-1}(-i\infty) = -\frac{i\pi}{2}$$

01.27.03.0030.01

$$|\tanh^{-1}(\infty)| = \frac{\pi}{2}$$

General characteristics

Domain and analyticity

$\tanh^{-1}(z)$ is an analytical function of z , which is defined over the whole complex z -plane.

01.27.04.0001.01

$$z \rightarrow \tanh^{-1}(z) :: \mathbb{C} \rightarrow \mathbb{C}$$

Symmetries and periodicities

Parity

$\tanh^{-1}(z)$ is an odd function.

01.27.04.0002.01

$$\tanh^{-1}(-z) = -\tanh^{-1}(z)$$

Mirror symmetry

01.27.04.0003.01

$$\tanh^{-1}(\bar{z}) = \overline{\tanh^{-1}(z)}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

Periodicity

No periodicity

Poles and essential singularities

The function $\tanh^{-1}(z)$ does not have poles and essential singularities.

01.27.04.0004.01

$$\text{Sing}_z(\tanh^{-1}(z)) = \{\}$$

Branch points

The function $\tanh^{-1}(z)$ has two branch points: $z = \pm 1$.

01.27.04.0005.01

$$\mathcal{BP}_z(\tanh^{-1}(z)) = \{-1, 1\}$$

01.27.04.0006.01

$$\mathcal{R}_z(\tanh^{-1}(z), 1) = \log$$

01.27.04.0007.01

$$\mathcal{R}_z(\tanh^{-1}(z), -1) = \log$$

Branch cut endpoints

At $z = \infty$ two logarithmic branch points coincide in "different" directions: $\tanh^{-1}(z) \propto -\frac{\pi\sqrt{-z^2}}{2z} + \mathcal{O}\left(\frac{1}{z}\right)$; ($|z| \rightarrow \infty$).

This results in $z = 0$ not being a branch point anymore; instead, two disconnected sheets arise.

Branch cuts

The function $\tanh^{-1}(z)$ is a single-valued function on the z -plane cut along the intervals $(-\infty, -1]$ and $[1, \infty)$.

The function $\tanh^{-1}(z)$ is continuous from above on the interval $(-\infty, -1]$ and from below on the interval $[1, \infty)$.

01.27.04.0008.01

$$\mathcal{BC}_z(\tanh^{-1}(z)) = \{(-\infty, -1], -i\}, \{[1, \infty), i\}$$

01.27.04.0009.01

$$\lim_{\epsilon \rightarrow +0} \tanh^{-1}(x + i\epsilon) = \tanh^{-1}(x) /; x < -1$$

01.27.04.0010.01

$$\lim_{\epsilon \rightarrow +0} \tanh^{-1}(x - i\epsilon) = \tanh^{-1}(x) - i\pi /; x < -1$$

01.27.04.0011.01

$$\lim_{\epsilon \rightarrow +0} \tanh^{-1}(x - i\epsilon) = \tanh^{-1}(x) /; x > 1$$

01.27.04.0012.01

$$\lim_{\epsilon \rightarrow +0} \tanh^{-1}(x + i\epsilon) = \tanh^{-1}(x) + i\pi /; x > 1$$

Analytic continuations

The analytic continuation of \tanh^{-1} has infinitely many sheets; the values of $\tilde{\tanh}^{-1}$ are $\tilde{\tanh}^{-1}(z) = \tanh^{-1}(z) + ik\pi /; k \in \mathbb{Z}$.

Series representations

Generalized power series

Expansions at generic point $z = z_0$

For the function itself

01.27.06.0020.01

$$\begin{aligned} \tanh^{-1}(z) \propto \tanh^{-1}(z_0) - \frac{1}{2} \left[\frac{\arg(z_0 - z)}{2\pi} \right] & \left(\log\left(\frac{1}{1 - z_0}\right) + \log(1 - z_0) \right) + \\ & \frac{1}{2} \left[\frac{\arg(z - z_0)}{2\pi} \right] \left(\log\left(\frac{1}{z_0 + 1}\right) + \log(z_0 + 1) \right) + \frac{z - z_0}{1 - z_0^2} + \frac{z_0(z - z_0)^2}{(z_0^2 - 1)^2} + \dots /; (z \rightarrow z_0) \end{aligned}$$

01.27.06.0021.01

$$\begin{aligned} \tanh^{-1}(z) \propto \tanh^{-1}(z_0) - \frac{1}{2} \left[\frac{\arg(z_0 - z)}{2\pi} \right] & \left(\log\left(\frac{1}{1 - z_0}\right) + \log(1 - z_0) \right) + \\ & \frac{1}{2} \left[\frac{\arg(z - z_0)}{2\pi} \right] \left(\log\left(\frac{1}{z_0 + 1}\right) + \log(z_0 + 1) \right) + \frac{z - z_0}{1 - z_0^2} + \frac{z_0(z - z_0)^2}{(z_0^2 - 1)^2} + O((z - z_0)^3) \end{aligned}$$

01.27.06.0022.01

$$\begin{aligned} \tanh^{-1}(z) = \tanh^{-1}(z_0) + \frac{1}{2} \left(- \left[\frac{\arg(z_0 - z)}{2\pi} \right] \left(\log\left(\frac{1}{1-z_0}\right) + \log(1-z_0) \right) + \right. \\ \left. \left[\frac{\arg(z-z_0)}{2\pi} \right] \left(\log\left(\frac{1}{z_0+1}\right) + \log(z_0+1) \right) + \sum_{k=1}^{\infty} \frac{1}{k(1-z_0^2)^k} \sum_{j=0}^k \binom{k}{j} (1+(-1)^{j+k-1}) z_0^j (z-z_0)^k \right) \end{aligned}$$

01.27.06.0023.01

$$\begin{aligned} \tanh^{-1}(z) = \tanh^{-1}(z_0) + \frac{1}{2} \left(- \left[\frac{\arg(z_0 - z)}{2\pi} \right] \left(\log\left(\frac{1}{1-z_0}\right) + \log(1-z_0) \right) + \right. \\ \left. \left[\frac{\arg(z-z_0)}{2\pi} \right] \left(\log\left(\frac{1}{z_0+1}\right) + \log(z_0+1) \right) + \sum_{k=1}^{\infty} \frac{(1-z_0)^{-k} + (-1)^{k-1} (z_0+1)^{-k}}{k} (z-z_0)^k \right) \end{aligned}$$

01.27.06.0024.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(z_0) - \frac{1}{2} \left[\frac{\arg(z_0 - z)}{2\pi} \right] \left(\log\left(\frac{1}{1-z_0}\right) + \log(1-z_0) \right) + \frac{1}{2} \left[\frac{\arg(z-z_0)}{2\pi} \right] \left(\log\left(\frac{1}{z_0+1}\right) + \log(z_0+1) \right) + O(z-z_0)$$

Expansions on branch cuts

For the function itself

In the left half-plane

01.27.06.0025.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) + i\pi \left[\frac{\arg(z-x)}{2\pi} \right] + \frac{1}{1-x^2} (z-x) + \frac{x}{(x^2-1)^2} (z-x)^2 + \dots /; (z \rightarrow x) \wedge x \in \mathbb{R} \wedge x < -1$$

01.27.06.0026.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) + i\pi \left[\frac{\arg(z-x)}{2\pi} \right] + \frac{1}{1-x^2} (z-x) + \frac{x}{(x^2-1)^2} (z-x)^2 + O((z-x)^3) /; x \in \mathbb{R} \wedge x < -1$$

01.27.06.0027.01

$$\tanh^{-1}(z) = \tanh^{-1}(x) + i\pi \left[\frac{\arg(z-x)}{2\pi} \right] + \frac{1}{2} \sum_{k=1}^{\infty} \frac{1}{k(1-x^2)^k} \sum_{j=0}^k \binom{k}{j} (1+(-1)^{j+k-1}) x^j (z-x)^k /; x \in \mathbb{R} \wedge x < -1$$

01.27.06.0028.01

$$\tanh^{-1}(z) = \tanh^{-1}(x) + i\pi \left[\frac{\arg(z-x)}{2\pi} \right] + \frac{1}{2} \sum_{k=1}^{\infty} \frac{(1-x)^{-k} + (-1)^{k-1} (x+1)^{-k}}{k} (z-x)^k /; x \in \mathbb{R} \wedge x < -1$$

01.27.06.0029.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) + i\pi \left[\frac{\arg(z-x)}{2\pi} \right] + O(z-x) /; x \in \mathbb{R} \wedge x < -1$$

In the right half-plane

01.27.06.0030.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) - \pi i \left[\frac{\arg(x-z)}{2\pi} \right] + \frac{z-x}{1-x^2} + \frac{x(z-x)^2}{(x^2-1)^2} + \dots ; (z \rightarrow x) \wedge x \in \mathbb{R} \wedge x > 1$$

01.27.06.0031.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) - \pi i \left[\frac{\arg(x-z)}{2\pi} \right] + \frac{z-x}{1-x^2} + \frac{x(z-x)^2}{(x^2-1)^2} + O((z-x)^3) ; x \in \mathbb{R} \wedge x > 1$$

01.27.06.0032.01

$$\tanh^{-1}(z) = \tanh^{-1}(x) - \pi i \left[\frac{\arg(x-z)}{2\pi} \right] + \frac{1}{2} \sum_{k=1}^{\infty} \frac{1}{k(1-x^2)^k} \sum_{j=0}^n \binom{k}{j} (1+(-1)^{j+k-1}) x^j (z-x)^k ; x \in \mathbb{R} \wedge x > 1$$

01.27.06.0033.01

$$\tanh^{-1}(z) \propto \tanh^{-1}(x) - \pi i \left[\frac{\arg(x-z)}{2\pi} \right] + O(z-x) ; x \in \mathbb{R} \wedge x > 1$$

Expansions at $z = 0$

For the function itself

01.27.06.0001.02

$$\tanh^{-1}(z) \propto z + \frac{z^3}{3} + \frac{z^5}{5} + \dots ; (z \rightarrow 0)$$

01.27.06.0034.01

$$\tanh^{-1}(z) \propto z + \frac{z^3}{3} + \frac{z^5}{5} + O(z^7)$$

01.27.06.0002.01

$$\tanh^{-1}(z) = \sum_{k=0}^{\infty} \frac{z^{2k+1}}{2k+1} ; |z| < 1$$

01.27.06.0003.01

$$\tanh^{-1}(z) = {}_2F_1\left(1, \frac{1}{2}; \frac{3}{2}; z^2\right)$$

01.27.06.0004.02

$$\tanh^{-1}(z) \propto z + O(z^3)$$

01.27.06.0035.01

$$\tanh^{-1}(z) = F_{\infty}(z) ; \left(F_n(z) = \sum_{k=0}^n \frac{z^{2k+1}}{2k+1} = \tanh^{-1}(z) - \frac{1}{2} B_{\frac{z}{2}}\left(n + \frac{3}{2}, 0\right) \right) \wedge n \in \mathbb{N}$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.27.06.0036.01

$$\tanh^{-1}(z)^2 \propto z^2 \left(1 + \frac{2z^2}{3} + \frac{23z^4}{45} + \dots \right) /; (z \rightarrow 0)$$

01.27.06.0037.01

$$\tanh^{-1}(z)^2 \propto z^2 \left(1 + \frac{2z^2}{3} + \frac{23z^4}{45} + O(z^6) \right)$$

01.27.06.0038.01

$$\tanh^{-1}(z)^2 = z^2 \left(\sum_{k=0}^{\infty} \frac{z^{2k}}{2k+1} \right)^2 /; |z| < 1$$

01.27.06.0039.01

$$\tanh^{-1}(z)^2 = z^2 {}_2F_1 \left(1, \frac{3}{2}; \frac{3}{2}; z^2 \right)^2$$

01.27.06.0040.01

$$\tanh^{-1}(z)^2 \propto z^2 (1 + O(z^2))$$

01.27.06.0041.01

$$\tanh^{-1}(z)^2 = F_{\infty}(z) /; \left(F_n(z) = z^2 \left(\sum_{k=0}^n \frac{z^{2k}}{2k+1} \right)^2 = \left(\tanh^{-1}(z) - \frac{z^{2n+3}}{2n+3} {}_2F_1 \left(1, n + \frac{3}{2}; n + \frac{5}{2}; z^2 \right) \right)^2 \right) \wedge n \in \mathbb{N}$$

Summed form of the truncated series expansion.

Expansions at $z = 1$

For the function itself

01.27.06.0005.01

$$\tanh^{-1}(z) \propto \frac{1}{2} \left(\log(2) - \log(1-z) + \frac{z-1}{2} - \frac{1}{8}(z-1)^2 + \dots \right) /; (z \rightarrow 1)$$

01.27.06.0042.01

$$\tanh^{-1}(z) \propto \frac{1}{2} \left(\log(2) - \log(1-z) + \frac{z-1}{2} - \frac{1}{8}(z-1)^2 + O((z-1)^3) \right)$$

01.27.06.0006.01

$$\tanh^{-1}(z) = \frac{1}{2} \left(\log(2) - \log(1-z) - \sum_{k=1}^{\infty} \frac{\left(-\frac{1}{2}\right)^k (z-1)^k}{k} \right) /; |z-1| < 2$$

01.27.06.0007.01

$$\tanh^{-1}(z) = \frac{\log(2)}{2} - \frac{1}{2} \log(1-z) + \frac{1}{4} (z-1) {}_2F_1 \left(1, 1; 2; \frac{1-z}{2} \right)$$

01.27.06.0008.02

$$\tanh^{-1}(z) \propto \frac{\log(2)}{2} - \frac{1}{2} \log(1-z) + \frac{z-1}{4} + O((z-1)^2)$$

01.27.06.0043.01

$$\tanh^{-1}(z) = F_{\infty}(z) /;$$

$$\left(\left(F_n(z) = \frac{1}{2} \log(2) - \frac{1}{2} \log(1-z) + \frac{z-1}{4} \sum_{k=0}^n \frac{\left(-\frac{1}{2}\right)^k (z-1)^k}{k+1} = \tanh^{-1}(z) + \frac{2^{-3-n}}{2+n} (1-z)^{n+2} {}_2F_1\left(1, n+2; n+3; \frac{1-z}{2}\right) \right) \wedge \right. \\ \left. n \in \mathbb{N} \right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.27.06.0044.01

$$\tanh^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{1-z}{2}\right) - \frac{1}{4} \log\left(\frac{1-z}{2}\right) (z-1) \left(1 - \frac{z-1}{4} + \frac{1}{12} (z-1)^2 + \dots\right) + \frac{1}{16} (z-1)^2 \left(1 - \frac{z-1}{2} + \frac{11}{48} (z-1)^2 + \dots\right) /;$$

$(z \rightarrow 1)$

01.27.06.0045.01

$$\tanh^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{1-z}{2}\right) - \frac{1}{4} \log\left(\frac{1-z}{2}\right) (z-1) \left(1 - \frac{z-1}{4} + \frac{1}{12} (z-1)^2 + O((z-1)^3)\right) + \\ \frac{1}{16} (z-1)^2 \left(1 - \frac{z-1}{2} + \frac{11}{48} (z-1)^2 + O((z-1)^3)\right)$$

01.27.06.0046.01

$$\tanh^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{1-z}{2}\right) - \frac{z-1}{4} \log\left(\frac{1-z}{2}\right) \sum_{k=0}^{\infty} \left(-\frac{1}{2}\right)^k \frac{(z-1)^k}{k+1} + \frac{(z-1)^2}{16} \left(\sum_{k=0}^{\infty} \left(-\frac{1}{2}\right)^k \frac{(z-1)^k}{k+1}\right)^2 /; |z-1| < 2$$

01.27.06.0047.01

$$\tanh^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{1-z}{2}\right) - \frac{1}{4} \log\left(\frac{1-z}{2}\right) (z-1) {}_2F_1\left(1, 1; 2; \frac{1-z}{2}\right) + \frac{(z-1)^2}{16} {}_2F_1\left(1, 1; 2; \frac{1-z}{2}\right)^2$$

01.27.06.0048.01

$$\tanh^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{1-z}{2}\right) - \frac{1-z}{4} \log\left(\frac{1-z}{2}\right) (z-1) (1 + O(z-1)) + \frac{1}{16} (z-1)^2 (1 + O(z-1))$$

01.27.06.0049.01

$$\tanh^{-1}(z)^2 = F_{\infty}(z) /;$$

$$\left(\left(F_n(z) = \left(\frac{1}{2} \log\left(\frac{1-z}{2}\right) + \frac{1-z}{4} \sum_{k=0}^n \frac{2^{-k} (1-z)^k}{k+1}\right)^2 = \left(\tanh^{-1}(z) + \frac{2^{-3-n}}{2+n} (1-z)^{n+2} {}_2F_1\left(1, n+2; n+3; \frac{1-z}{2}\right)\right)^2 \right) \wedge n \in \mathbb{N} \right)$$

Summed form of the truncated series expansion.

Expansions at $z = -1$

For the function itself

01.27.06.0009.02

$$\tanh^{-1}(z) \propto \frac{1}{2} \left(-\log(2) + \log(z+1) + \frac{z+1}{2} + \frac{1}{8}(z+1)^2 + \dots \right); (z \rightarrow -1)$$

01.27.06.0050.01

$$\tanh^{-1}(z) \propto \frac{1}{2} \left(-\log(2) + \log(z+1) + \frac{z+1}{2} + \frac{1}{8}(z+1)^2 + O((z+1)^3) \right)$$

01.27.06.0010.01

$$\tanh^{-1}(z) = \frac{1}{2} \left(-\log(2) + \log(z+1) + \sum_{k=1}^{\infty} \frac{\left(\frac{1}{2}\right)^k (z+1)^k}{k} \right); |z+1| < 2$$

01.27.06.0011.01

$$\tanh^{-1}(z) = -\frac{\log(2)}{2} + \frac{1}{2} \log(z+1) + \frac{1}{4}(z+1) {}_2F_1\left(1, 1; 2; \frac{z+1}{2}\right)$$

01.27.06.0012.02

$$\tanh^{-1}(z) \propto -\frac{\log(2)}{2} + \frac{1}{2} \log(z+1) + \frac{z+1}{4} + O((z+1)^2)$$

01.27.06.0051.01

$$\begin{aligned} \tanh^{-1}(z) &= F_{\infty}(z); \\ \left(\left(F_n(z) &= -\frac{1}{2} \log(2) + \frac{1}{2} \log(z+1) + \frac{z+1}{4} \sum_{k=0}^n \frac{2^{-k} (z+1)^k}{k+1} = \tanh^{-1}(z) - \frac{2^{-3-n}}{2+n} (z+1)^{n+2} {}_2F_1\left(1, n+2; n+3; \frac{z+1}{2}\right) \right) \wedge \right. \\ &\left. n \in \mathbb{N} \right) \end{aligned}$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.27.06.0052.01

$$\begin{aligned} \tanh^{-1}(z)^2 &\propto \frac{1}{4} \log^2\left(\frac{z+1}{2}\right) + \frac{1}{4} \log\left(\frac{z+1}{2}\right) (z+1) \left(1 + \frac{z+1}{4} + \frac{1}{12}(z+1)^2 + \dots\right) + \frac{1}{16} (z+1)^2 \left(1 + \frac{z+1}{2} + \frac{11}{48}(z+1)^2 + \dots\right); \\ &(z \rightarrow -1) \end{aligned}$$

01.27.06.0053.01

$$\begin{aligned} \tanh^{-1}(z)^2 &\propto \frac{1}{4} \log^2\left(\frac{z+1}{2}\right) + \frac{1}{4} \log\left(\frac{z+1}{2}\right) (z+1) \left(1 + \frac{z+1}{4} + \frac{1}{12}(z+1)^2 + O((z+1)^3)\right) + \\ &\frac{1}{16} (z+1)^2 \left(1 + \frac{z+1}{2} + \frac{11}{48}(z+1)^2 + O((z+1)^3)\right) \end{aligned}$$

01.27.06.0054.01

$$\tanh^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{z+1}{2}\right) + \frac{z+1}{4} \log\left(\frac{z+1}{2}\right) \sum_{k=0}^{\infty} \frac{(z+1)^k}{2^k (k+1)} \frac{(z-1)^k}{k+1} + \frac{(z+1)^2}{16} \left(\sum_{k=0}^{\infty} \frac{(z+1)^k}{2^k (k+1)} \right)^2; |z+1| < 2$$

01.27.06.0055.01

$$\tanh^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{z+1}{2}\right) + \frac{1}{4} \log\left(\frac{z+1}{2}\right) (z+1) {}_2F_1\left(1, 1; 2; \frac{z+1}{2}\right) + \frac{(z-1)^2}{16} {}_2F_1\left(1, 1; 2; \frac{z+1}{2}\right)^2$$

01.27.06.0056.01

$$\tanh^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{z+1}{2}\right) + \frac{1}{4} \log\left(\frac{z+1}{2}\right) (z+1) (1 + O(z+1)) + \frac{1}{16} (z+1)^2 (1 + O(z+1))$$

01.27.06.0057.01

$$\tanh^{-1}(z)^2 = F_\infty(z) /;$$

$$\left(\left(F_n(z) = \left(\frac{1}{2} \log\left(\frac{z+1}{2}\right) + \frac{z+1}{4} \sum_{k=0}^n \frac{2^{-k} (z+1)^k}{k+1} \right)^2 = \left(\tanh^{-1}(z) - \frac{2^{-3-n}}{2+n} (z+1)^{n+2} {}_2F_1\left(1, n+2; n+3; \frac{z+1}{2}\right) \right)^2 \right) \bigwedge n \in \mathbb{N} \right)$$

Summed form of the truncated series expansion.

Expansions at $z = \infty$

For the function itself

01.27.06.0013.02

$$\tanh^{-1}(z) \propto \frac{\pi z}{2\sqrt{-z^2}} + \frac{1}{z} + \frac{1}{3z^3} + \frac{1}{5z^5} + \dots /; |z| \rightarrow \infty$$

01.27.06.0058.01

$$\tanh^{-1}(z) \propto \frac{\pi z}{2\sqrt{-z^2}} + \frac{1}{z} + \frac{1}{3z^3} + \frac{1}{5z^5} + O\left(\frac{1}{z^7}\right)$$

01.27.06.0014.01

$$\tanh^{-1}(z) = \frac{\pi z}{2\sqrt{-z^2}} + \sum_{k=0}^{\infty} \frac{z^{-2k-1}}{2k+1} /; |z| > 1$$

01.27.06.0015.01

$$\tanh^{-1}(z) = \frac{\pi z}{2\sqrt{-z^2}} + \frac{1}{z} {}_2F_1\left(\frac{1}{2}, 1; \frac{3}{2}; \frac{1}{z^2}\right) /; z \notin (-1, 1)$$

01.27.06.0016.02

$$\tanh^{-1}(z) \propto -\frac{\pi\sqrt{-z^2}}{2z} + \frac{1}{z} + O\left(\frac{1}{z^3}\right)$$

01.27.06.0059.01

$$\tanh^{-1}(z) \propto \begin{cases} -\frac{i\pi}{2} & \arg(z) \leq 0 \\ \frac{i\pi}{2} & \text{True} \end{cases} /; (|z| \rightarrow \infty)$$

01.27.06.0060.01

$$\tanh^{-1}(z) = F_\infty(z) /; \left(\left(F_n(z) = \frac{\pi z}{2\sqrt{-z^2}} + \sum_{k=0}^n \frac{z^{-2k-1}}{2k+1} = \tanh^{-1}(z) - \frac{z^{-2n-3}}{2n+3} {}_2F_1\left(1, n+\frac{3}{2}; n+\frac{5}{2}; \frac{1}{z^2}\right) \right) \bigwedge n \in \mathbb{N} \right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.27.06.0061.01

$$\tanh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} \left(1 + \frac{1}{3z^2} + \frac{1}{5z^4} + \dots \right) + \frac{1}{z^2} \left(1 + \frac{2}{3z^2} + \frac{23}{45z^4} + \dots \right) /; (|z| \rightarrow \infty)$$

01.27.06.0062.01

$$\tanh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} \left(1 + \frac{1}{3z^2} + \frac{1}{5z^4} + \mathcal{O}\left(\frac{1}{z^6}\right) \right) + \frac{1}{z^2} \left(1 + \frac{2}{3z^2} + \frac{23}{45z^4} + \mathcal{O}\left(\frac{1}{z^6}\right) \right)$$

01.27.06.0063.01

$$\tanh^{-1}(z)^2 = -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} \sum_{k=0}^{\infty} \frac{z^{-2k}}{2k+1} + \frac{1}{z^2} \left(\sum_{k=0}^{\infty} \frac{z^{-2k}}{2k+1} \right)^2 /; |z| > 1$$

01.27.06.0064.01

$$\tanh^{-1}(z)^2 = -\frac{\pi^2}{4} + \frac{\pi z}{\sqrt{-z^2}} \tanh^{-1}\left(\frac{1}{z}\right) + \tanh^{-1}\left(\frac{1}{z}\right)^2 /; z \notin (-1, 1)$$

01.27.06.0065.01

$$\tanh^{-1}(z)^2 = -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} {}_2F_1\left(\frac{1}{2}, 1; \frac{3}{2}; \frac{1}{z^2}\right) + \frac{1}{z^2} {}_2F_1\left(\frac{1}{2}, 1; \frac{3}{2}; \frac{1}{z^2}\right)^2 /; z \notin (-1, 1)$$

01.27.06.0066.01

$$\tanh^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} \left(1 + \mathcal{O}\left(\frac{1}{z^2}\right) \right) + \frac{1}{z^2} \left(1 + \mathcal{O}\left(\frac{1}{z^2}\right) \right)$$

01.27.06.0067.01

$$\tanh^{-1}(z)^2 \propto \left\{ -\frac{\pi^2}{4} /; (|z| \rightarrow \infty) \right.$$

01.27.06.0068.01

$$\tanh^{-1}(z)^2 = F_{\infty}(z) /;$$

$$\left(\left(F_n(z) = -\frac{\pi^2}{4} + \frac{\pi}{\sqrt{-z^2}} \sum_{k=0}^n \frac{z^{-2k}}{2k+1} + \frac{1}{z^2} \left(\sum_{k=0}^n \frac{z^{-2k}}{2k+1} \right)^2 = \left(\tanh^{-1}(z) - \frac{z^{-2n-3}}{2n+3} {}_2F_1\left(1, n + \frac{3}{2}; n + \frac{5}{2}; \frac{1}{z^2}\right) \right)^2 \right) \wedge n \in \mathbb{N} \right)$$

Summed form of the truncated series expansion.

Residue representations

01.27.06.0017.01

$$\tanh^{-1}(z) = \frac{z}{2} \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\Gamma\left(\frac{1}{2} - s\right) \Gamma(1-s) (-z^2)^{-s}}{\Gamma\left(\frac{3}{2} - s\right)} \Gamma(s) \right) (-j) /; |z| < 1$$

01.27.06.0018.01

$$\tanh^{-1}(z) = -\frac{z}{2} \left(\sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\Gamma(s) \Gamma(1-s) (-z^2)^{-s}}{\Gamma(\frac{3}{2}-s)} \Gamma\left(\frac{1}{2}-s\right) \right) \left(\frac{1}{2}+j\right) + \sum_{j=0}^{\infty} \operatorname{res}_s \left(\frac{\Gamma(s) \Gamma(\frac{1}{2}-s) (-z^2)^{-s}}{\Gamma(\frac{3}{2}-s)} \Gamma(1-s) \right) (1+j) \right) ; |z| > 1$$

Other series representations

01.27.06.0019.01

$$\tanh^{-1}(z) = \sum_{k=0}^{\infty} \frac{F_{2k+1}}{5^k (2k+1)} \left(\frac{2z}{\sqrt{1-4z^2/5} + 1} \right)^{2k+1} ; |z| < 1$$

Integral representations

On the real axis

Of the direct function

01.27.07.0001.01

$$\tanh^{-1}(z) = z \int_0^1 \frac{1}{1-z^2 t^2} dt ; \operatorname{Im}(z) > 0 \vee \operatorname{Im}(z) = 0 \wedge -1 < z < 1$$

Contour integral representations

01.27.07.0002.01

$$\tanh^{-1}(z) = \frac{z}{4\pi i} \int_{\mathcal{L}} \frac{\Gamma(s) \Gamma(\frac{1}{2}-s) \Gamma(1-s) (-z^2)^{-s}}{\Gamma(\frac{3}{2}-s)} ds ; |\arg(-z^2)| < \pi$$

01.27.07.0003.01

$$\tanh^{-1}(z) = -\frac{iz}{4\pi^{3/2}} \int_{\mathcal{L}} \Gamma(s)^2 \Gamma\left(\frac{1}{2}-s\right) \Gamma(1-s) (1-z^2)^{-s} ds ; |\arg(1-z^2)| < \pi$$

01.27.07.0004.01

$$\tanh^{-1}(z) = \frac{z}{4\pi i} \int_{\gamma-i\infty}^{\gamma+i\infty} \frac{\Gamma(s) \Gamma(\frac{1}{2}-s) \Gamma(1-s) (-z^2)^{-s}}{\Gamma(\frac{3}{2}-s)} ds ; 0 < \gamma < \frac{1}{2} \wedge |\arg(-z^2)| < \pi$$

01.27.07.0005.01

$$\tanh^{-1}(z) = -\frac{iz}{4\pi^{3/2}} \int_{\gamma-i\infty}^{\gamma+i\infty} \Gamma(s)^2 \Gamma\left(\frac{1}{2}-s\right) \Gamma(1-s) (1-z^2)^{-s} ds ; 0 < \gamma < \frac{1}{2} \wedge |\arg(1-z^2)| < \pi$$

Continued fraction representations

01.27.10.0001.01

$$\tanh^{-1}(z) = \frac{z}{1 - \frac{z^2}{3 - \frac{4z^2}{5 - \frac{9z^2}{7 - \frac{16z^2}{9 - \frac{25z^2}{11 - \frac{36z^2}{13 - \dots}}}}}}}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.10.0002.01

$$\tanh^{-1}(z) = \frac{z}{1 + K_k(-k^2 z^2, 2k+1)_1^\infty}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.10.0003.01

$$\tanh^{-1}(z) = z + \frac{z^3}{3 - \frac{9z^2}{5 - \frac{4z^2}{7 - \frac{25z^2}{9 - \frac{16z^2}{11 - \frac{49z^2}{13 - \frac{36z^2}{15 - \dots}}}}}}}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.10.0004.01

$$\tanh^{-1}(z) = z + \frac{z^3}{3 + K_k(-(k - (-1)^k + 1)^2 z^2, 2k+3)_1^\infty}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.10.0005.01

$$\tanh^{-1}(z) = \frac{z}{1 - z^2 + \frac{2z^2}{3 + \frac{2z^2}{5(1 - z^2) + \frac{12z^2}{7 + \frac{12z^2}{9(1 - z^2) + \frac{30z^2}{11 + \frac{30z^2}{13(1 - z^2) + \dots}}}}}}}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.10.0006.01

$$\tanh^{-1}(z) = \frac{z}{1 - z^2 + K_k\left(2z^2 \left[\frac{k+1}{2}\right] \left(2 \left[\frac{k+1}{2}\right] - 1\right), (2k+1) \left(1 - \frac{1}{2} (1 + (-1)^k) z^2\right)\right)_1^\infty}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

01.27.13.0001.01

$$(1 - z^2)w''(z) - 2zw'(z) = 0 /; w(z) = \tanh^{-1}(z) \wedge w(0) = 0 \wedge w'(0) = 1$$

01.27.13.0002.01

$$(1 - z^2)w''(z) - 2zw'(z) = 0 /; w(z) = c_1 + c_2 \tanh^{-1}(z)$$

01.27.13.0003.01

$$W_z(1, \tanh^{-1}(z)) = \frac{1}{1 - z^2}$$

01.27.13.0004.01

$$(1 - z^2)w'(z) = 1 /; w(z) = \tanh^{-1}(z) \wedge w(0) = 0$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

Involving $\tanh^{-1}(-z)$

Involving $\tanh^{-1}(-z)$ and $\tanh^{-1}(z)$

01.27.16.0001.01

$$\tanh^{-1}(-z) = -\tanh^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\tanh^{-1}(z)$

01.27.16.0016.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -\frac{\pi i}{2} + \tanh^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0017.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \frac{\pi i}{2} + \tanh^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0018.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \tanh^{-1}(z) + \frac{\pi \sqrt{-z^2}}{2z} /; z \notin (-1, 1)$$

01.27.16.0019.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \tanh^{-1}(z) - \frac{\pi i}{2} \operatorname{sgn}(\operatorname{Im}(z)) /; \operatorname{Im}(z) \neq 0$$

01.27.16.0020.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.16.0021.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0022.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0023.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.16.0024.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0025.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0026.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.16.0027.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\tanh^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.16.0028.01

$$\tanh^{-1}(\sqrt{z}) = \tanh^{-1}\left(1 / \sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.27.16.0029.01

$$\tanh^{-1}(\sqrt{z}) = -\tanh^{-1}\left(1 / \sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.16.0030.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.27.16.0031.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0032.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \tanh^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0033.01

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

Involving $\tanh^{-1}(\sqrt{z^2})$

Involving $\tanh^{-1}(\sqrt{z^2})$ and $\tanh^{-1}(z)$

01.27.16.0034.01

$$\tanh^{-1}(\sqrt{z^2}) = \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.16.0035.01

$$\tanh^{-1}(\sqrt{z^2}) = -\tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.16.0005.01

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

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

01.27.16.0036.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0037.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0038.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.16.0039.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0040.01

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

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

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

01.27.16.0132.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = \frac{\pi i}{2} + \tanh^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee |z| > 1 \wedge -\pi < \arg(z) < -\frac{\pi}{2} \vee z \in \mathbb{R} \wedge z > 1$$

01.27.16.0133.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = -\frac{1}{2}(\pi i) + \tanh^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \vee |z| > 1 \wedge \frac{\pi}{2} \leq \arg(z) \leq \pi \vee z \in \mathbb{R} \wedge 0 < z < 1$$

01.27.16.0134.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = -\frac{1}{2}(\pi i) - \tanh^{-1}(z) /; |z| < 1 \wedge -\pi < \arg(z) < -\frac{\pi}{2} \vee z \in \mathbb{R} \wedge -1 < z < 0$$

01.27.16.0135.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = \frac{\pi i}{2} - \tanh^{-1}(z) /; |z| < 1 \wedge \frac{\pi}{2} \leq \arg(z) < \pi$$

01.27.16.0136.01

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

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

01.27.16.0137.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = \tanh^{-1}\left(\frac{1}{z}\right) ; |z| > 1 \vee |z| < 1 \wedge -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.16.0138.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) = -\tanh^{-1}\left(\frac{1}{z}\right) ; |z| < 1 \wedge \left(\frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}\right)$$

01.27.16.0139.01

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

Involving $\tanh^{-1}(a(bz^c)^m)$

Involving $\tanh^{-1}(a(bz^c)^m)$ and $\tanh^{-1}(ab^m z^{mc})$

01.27.16.0002.01

$$\tanh^{-1}(a(bz^c)^m) = \frac{(bz^c)^m}{b^m z^{mc}} \tanh^{-1}(ab^m z^{mc}) ; 2m \in \mathbb{Z}$$

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

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\tanh^{-1}(z)$

01.27.16.0003.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2 \tanh^{-1}(z) ; |z| < 1$$

01.27.16.0041.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2 \tanh^{-1}(z) - \pi i ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.16.0042.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2 \tanh^{-1}(z) + \pi i ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.16.0043.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2 \tanh^{-1}(z) + \frac{\pi \sqrt{-z^2}}{z} \quad ; |z| > 1$$

01.27.16.0044.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = \frac{\pi \sqrt{-z^2}}{2z} \left(\frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2 + 1} \right) + 2 \tanh^{-1}(z) \quad ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.27.16.0045.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi i + 2 \tanh^{-1}\left(\frac{1}{z}\right) \quad ; |z| < 1 \wedge 0 \leq \arg(z) < \pi$$

01.27.16.0046.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -\pi i + 2 \tanh^{-1}\left(\frac{1}{z}\right) \quad ; |z| < 1 \wedge -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0047.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi \sqrt{-\frac{1}{z^2}} z + 2 \tanh^{-1}\left(\frac{1}{z}\right) \quad ; |z| < 1$$

01.27.16.0048.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2 \tanh^{-1}\left(\frac{1}{z}\right) \quad ; |z| > 1$$

01.27.16.0049.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \frac{\pi}{2} \left(1 - \frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2} \right) \sqrt{-\frac{1}{z^2}} z + 2 \tanh^{-1}\left(\frac{1}{z}\right) \quad ; |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\tanh^{-1}(z)$

01.27.16.0050.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2 \tanh^{-1}(z) - \frac{\pi i}{2} \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0051.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2 \tanh^{-1}(z) + \frac{\pi i}{2} \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0052.01

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.27.16.0053.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0054.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0055.01

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

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

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

01.27.16.0056.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}(\sqrt{z}) /; |z| < 1$$

01.27.16.0057.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}(\sqrt{z}) - \pi i /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.16.0058.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}(\sqrt{z}) + \pi i /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.16.0059.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}(\sqrt{z}) + \frac{\pi \sqrt{-z^2}}{z} /; |z| > 1$$

01.27.16.0060.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = \frac{\pi \sqrt{-z}}{2\sqrt{z}} \left(\frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2 + 1} \right) + 2 \tanh^{-1}(\sqrt{z}) /; |z| \neq 1$$

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

01.27.16.0061.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i ; |z| < 1 \wedge \text{Im}(z) \geq 0$$

01.27.16.0062.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.16.0063.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi \sqrt{-\frac{1}{z}} \sqrt{z} ; |z| < 1$$

01.27.16.0064.01

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

01.27.16.0065.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right) = \frac{\pi \sqrt{z}}{2} \sqrt{-\frac{1}{z}} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right) + 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) ; |z| \neq 1$$

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

01.27.16.0066.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i ; |z| < 1 \wedge 0 \leq \arg(z) < \pi$$

01.27.16.0067.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.16.0068.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = -2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0069.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \sqrt{z} \sqrt{\frac{1}{z}} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi \sqrt{-\frac{1}{z}} \sqrt{z} ; |z| < 1$$

01.27.16.0070.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) ; |z| > 1 \wedge |\arg(z)| < \pi$$

01.27.16.0071.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = -2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.16.0072.01

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

01.27.16.0073.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right) = \frac{\pi\sqrt{z}}{2} \sqrt{\frac{1}{z}} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right) + 2\sqrt{z} \sqrt{\frac{1}{z}} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| \neq 1$$

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

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

01.27.16.0074.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}(\sqrt{z}) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0075.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}(\sqrt{z}) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0076.01

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

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

01.27.16.0077.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0078.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0079.01

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

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

01.27.16.0080.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0081.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0082.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = -2 \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.16.0083.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + cz\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + z\right)$ and $\tanh^{-1}(z)$

01.27.16.0084.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{1}{2} \tanh^{-1}(z) + \frac{\pi i}{4} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.16.0085.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{1}{2} \tanh^{-1}(z) - \frac{\pi i}{4} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0086.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{1}{2} \tanh^{-1}(z) + \frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

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

01.27.16.0087.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{\pi i}{2} + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0088.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.16.0089.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = -\frac{\pi i}{2} + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \quad \vee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0090.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{\pi \sqrt{z-1}}{4 \sqrt{1-z} z} \left(z + \sqrt{z^2}\right) + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right)$ and $\tanh^{-1}(z)$

01.27.16.0091.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{1}{2} \tanh^{-1}(z) + \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \quad \vee \quad -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \vee \quad (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.16.0092.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{1}{2} \tanh^{-1}(z) - \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \quad \vee \quad -\frac{\pi}{2} < \arg(z) < 0 \quad \vee \quad (z \in \mathbb{R} \wedge z < -1) \quad \vee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0093.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{1}{2} \tanh^{-1}(z) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

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

01.27.16.0094.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.16.0095.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{\pi i}{2} - \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \quad \vee \quad (z \in \mathbb{R} \wedge z < -1)$$

01.27.16.0096.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{\pi i}{2} - \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \vee \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0097.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{\pi \sqrt{-z-1} \left(z - \sqrt{z^2}\right)}{4 \sqrt{z+1} z} - \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right)$$

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

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

01.27.16.0098.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \tanh^{-1}(z) - \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.16.0099.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \tanh^{-1}(z) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0100.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \tanh^{-1}(z) - \frac{\pi \sqrt{z^2-1}}{4 \sqrt{1-z^2}}$$

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

01.27.16.0101.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.16.0102.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{\pi i}{2} + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.16.0103.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = -\frac{\pi i}{2} + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0104.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = -\frac{\pi \sqrt{-z-1} (z - \sqrt{z^2})}{4 \sqrt{z+1} z} + \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right)$$

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

01.27.16.0105.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \tanh^{-1}(z) - \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.16.0106.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \tanh^{-1}(z) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0107.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2}\tanh^{-1}(z) - \frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

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

01.27.16.0108.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi i}{2} - \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0109.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.16.0110.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{\pi i}{2} - \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.16.0111.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi\sqrt{z-1}}{4\sqrt{1-z}z}(z+\sqrt{z^2}) - \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)$$

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

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

01.27.16.0112.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{\pi i}{2} + \frac{1}{2}\tanh^{-1}(z); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0113.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{\pi i}{2} + \frac{1}{2}\tanh^{-1}(z); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0114.01

$$\tanh^{-1}\left(\frac{1+\sqrt{1-z^2}}{z}\right) = \frac{1}{2}\tanh^{-1}(z) - \frac{\pi z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}$$

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

01.27.16.0115.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0116.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0117.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

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

01.27.16.0118.01

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

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

01.27.16.0119.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0120.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0121.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

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

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

01.27.16.0122.01

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

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

01.27.16.0123.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0124.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0125.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

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

01.27.16.0126.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{\pi i}{2} - \frac{1}{2} \tanh^{-1}(z); \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0127.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{\pi i}{2} - \frac{1}{2} \tanh^{-1}(z); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0128.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2} \tanh^{-1}(z) + \frac{\pi z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}}$$

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

01.27.16.0129.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.16.0130.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.16.0131.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Products, sums, and powers of the direct function

Sums of the direct function

01.27.16.0006.01

$$\tanh^{-1}(x) + \tanh^{-1}(y) = \tanh^{-1}\left(\frac{x+y}{xy+1}\right) - \frac{\pi i}{2} \operatorname{sgn}(x+y)(1 - \operatorname{sgn}(xy+1)); |x| < 1 \vee |y| < 1$$

01.27.16.0007.01

$$\tanh^{-1}(x) + \tanh^{-1}(y) = \tanh^{-1}\left(\frac{x+y}{xy+1}\right) - \frac{\pi i}{2} \operatorname{sgn}(x+y)(\operatorname{sgn}(xy+1) + 1); |x| > 1 \wedge |y| > 1$$

01.27.16.0140.01

$$\begin{aligned} \tanh^{-1}(x) + \tanh^{-1}(y) = \\ \tanh^{-1}\left(\frac{x+y}{xy+1}\right) + i\pi \left[\frac{-\arg(1-x) - \arg(1-y) + \arg(xy+1) + \pi}{2\pi} \right] - \pi i \left[\frac{-\arg(x+1) - \arg(y+1) + \arg(xy+1) + \pi}{2\pi} \right] \end{aligned}$$

Differences of the direct function

01.27.16.0008.01

$$\tanh^{-1}(x) - \tanh^{-1}(y) = \tanh^{-1}\left(\frac{x-y}{1-xy}\right) - \frac{\pi i}{2} \operatorname{sgn}(x-y)(1 - \operatorname{sgn}(1-xy)); |x| < 1 \vee |y| < 1$$

01.27.16.0009.01

$$\tanh^{-1}(x) - \tanh^{-1}(y) = \tanh^{-1}\left(\frac{x-y}{1-xy}\right) - \frac{\pi i}{2} \operatorname{sgn}(x-y)(\operatorname{sgn}(1-xy) + 1); |x| > 1 \wedge |y| > 1$$

01.27.16.0141.01

$$\begin{aligned} \tanh^{-1}(x) - \tanh^{-1}(y) = \\ \tanh^{-1}\left(\frac{x-y}{1-xy}\right) - i\pi \left[\frac{-\arg(x+1) - \arg(1-y) + \arg(1-xy) + \pi}{2\pi} \right] + i\pi \left[\frac{-\arg(1-x) - \arg(y+1) + \arg(1-xy) + \pi}{2\pi} \right] \end{aligned}$$

Linear combinations of the direct function

01.27.16.0142.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \tanh^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}(b \log(1-y)) + \pi}{2\pi} \right] \right) - \\
 & 2 i \pi \left(\left[\frac{-\arg((y+1)^{b/2}) - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Im}(b \log(y+1))}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}}\right)\right)}{2\pi} \right] \right) + \\
 & \log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}} (y+1)^{b/2}\right)
 \end{aligned}$$

01.27.16.0143.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \tanh^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}(b \log(1-y)) + \pi}{2\pi} \right] \right) - \\
 & 2 i \pi \left(\left[\frac{-\arg((y+1)^{b/2}) - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Im}(b \log(y+1))}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}}\right)\right)}{2\pi} \right] \right) + \\
 & i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}} (y+1)^{b/2+1}\right)}{2\pi} \right\rfloor + \frac{1}{2}} \right) + 2 \tanh^{-1}\left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}} (y+1)^{b/2} - 1}{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (1-y)^{-\frac{b}{2}} (y+1)^{b/2} + 1}\right)
 \end{aligned}$$

Related transformations

Sums involving the direct function

Involving log(z)

01.27.16.0144.01

$$\tanh^{-1}(x) + \log(y) =$$

$$i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg(y) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}(\log(y))}{2\pi} \right] \right) + \log \left(\frac{y}{\sqrt{\frac{1-x}{x+1}}} \right)$$

01.27.16.0145.01

$$\tanh^{-1}(x) + \log(y) =$$

$$i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg(y) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}(\log(y))}{2\pi} \right] \right) + \left(\frac{\arg\left(\frac{y}{\sqrt{\frac{1-x}{x+1}}} + 1\right)}{2\pi} + \frac{1}{2} \right) + 2 \tanh^{-1} \left(\frac{\frac{y}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{y}{\sqrt{\frac{1-x}{x+1}}} + 1} \right)$$

Involving $\sin^{-1}(z)$

01.27.16.0146.01

$$\tanh^{-1}(x) + \sin^{-1}(y) = i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right] \right) +$$

$$\log \left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}} \right)$$

01.27.16.0147.01

$$\begin{aligned} \tanh^{-1}(x) + \sin^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right] \right) \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right]} \right) + 2 \tanh^{-1} \left(\frac{\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}} + 1} \right) \end{aligned}$$

01.27.16.0148.01

$$\begin{aligned} \tanh^{-1}(x) + i \sin^{-1}(y) &= -\frac{i\sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{y-ix\sqrt{1-y^2}} \sin^{-1}\left(\frac{ixy + \sqrt{1-y^2}}{\sqrt{1-x^2}}\right) + \\ &\frac{\pi i \sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{2(y-ix\sqrt{1-y^2})} + \pi i \left(\frac{\sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}} \sqrt{1-x^2}}{y-ix\sqrt{1-y^2}} + 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] - \\ &\pi i \left(\frac{\sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{y-ix\sqrt{1-y^2}} - 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0149.01

$$\tanh^{-1}(x) + i \sin^{-1}(y) = \tanh^{-1} \left(\frac{(-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \sqrt{1-x^2} \sqrt{1 - \frac{(-ixy - \sqrt{1-y^2})^2}{1-x^2}}}{xy - i\sqrt{1-y^2}} \right) +$$

$$\frac{1}{2} i \pi \left(2 \left(1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] + (-1)^{\left[-\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(-ixy - \sqrt{1-y^2})}{\pi} + \frac{1}{2} \right]} \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] \right) +$$

$$(-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right]$$

Involving $\cos^{-1}(z)$

01.27.16.0150.01

$$\tanh^{-1}(x) + \cos^{-1}(y) = i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^i\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) +$$

$$\log \left(\frac{\left(iy + \sqrt{1-y^2}\right)^i}{\sqrt{\frac{1-x}{x+1}}} \right) + \frac{\pi}{2}$$

01.27.16.0151.01

$$\begin{aligned} \tanh^{-1}(x) + \cos^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \pi}{2\pi} \right] + \frac{1}{2}} \right) + 2 \tanh^{-1} \left(\frac{\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}} + 1} \right) + \frac{\pi}{2} \end{aligned}$$

01.27.16.0152.01

$$\begin{aligned} \tanh^{-1}(x) + i \cos^{-1}(y) &= \frac{i\pi}{2} + \frac{i\sqrt{1-x^2} \sqrt{\frac{(i\sqrt{1-y^2} - x+y)^2}{1-x^2}}}{i\sqrt{1-y^2} x+y} \sin^{-1} \left(\frac{\sqrt{1-y^2} - ixy}{\sqrt{1-x^2}} \right) - \\ &\frac{\pi i \sqrt{1-x^2} \sqrt{\frac{(i\sqrt{1-y^2} - x+y)^2}{1-x^2}}}{2(i\sqrt{1-y^2} x+y)} - \pi i \left(\frac{\sqrt{\frac{(i\sqrt{1-y^2} - x+y)^2}{1-x^2}} \sqrt{1-x^2}}{i\sqrt{1-y^2} x+y} + 1 \right) \left[\frac{\arg\left(\frac{i-x}{\sqrt{1-x^2}}\right) + \arg(iy + \sqrt{1-y^2})}{2\pi} \right] + \\ &\pi i \left(\frac{\sqrt{1-x^2} \sqrt{\frac{(i\sqrt{1-y^2} - x+y)^2}{1-x^2}}}{i\sqrt{1-y^2} x+y} - 1 \right) \left[\frac{\arg\left(\frac{i-x}{\sqrt{1-x^2}}\right) + \arg(iy + \sqrt{1-y^2}) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0153.01

$$\tanh^{-1}(x) + i \cos^{-1}(y) = \frac{1}{2} i \pi \left(1 + 2 \left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \right) \left[\frac{\arg\left(\frac{i x + i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-y^2} - i y\right)}{2 \pi} \right] + \right.$$

$$\left. (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \right) + (-1)^{\left\lfloor -\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(i x y - \sqrt{1-y^2})}{\pi} + \frac{1}{2} \right\rfloor} + \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right) -$$

$$2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{i x + i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-y^2} - i y\right)}{2 \pi} \right] -$$

$$\tanh^{-1} \left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \sqrt{1-x^2} \sqrt{1 - \frac{(i x y - \sqrt{1-y^2})^2}{1-x^2}}}{x y + i \sqrt{1-y^2}} \right)$$

Involving $\tan^{-1}(z)$

01.27.16.0154.01

$$\begin{aligned} \tanh^{-1}(x) + \tan^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{-\arg\left(\frac{(1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left((iy+1)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(\log(iy+1)) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] \right) - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg((1-iy)^{i/2}) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(\log(1-iy))}{2\pi} \right] \right) + \log\left(\frac{(1-iy)^{i/2} (iy+1)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) \end{aligned}$$

01.27.16.0155.01

$$\begin{aligned} \tanh^{-1}(x) + \tan^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{-\arg\left(\frac{(1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left((iy+1)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(\log(iy+1)) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] \right) - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg((1-iy)^{i/2}) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(\log(1-iy))}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{\frac{i}{(iy+1)^{\frac{i}{2}} (1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} + 1\right)}{2\pi} + \frac{1}{2}} \right]} \right) + 2 \tanh^{-1} \left(\frac{\frac{(1-iy)^{i/2} (iy+1)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{(iy+1)^{-\frac{i}{2}} (1-iy)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} + 1} \right) \end{aligned}$$

01.27.16.0156.01

$$\begin{aligned} \tanh^{-1}(x) + i \tan^{-1}(y) &= \\ &i \left(\tan^{-1} \left(\frac{-x-iy}{-i+xy} \right) - \pi \left[\frac{-\arg(x+1) - \arg(iy+1) + \arg(ixy+1) + \pi}{2\pi} \right] + \pi \left[\frac{-\arg(1-x) + \arg(ixy+1) - \arg(1-iy) + \pi}{2\pi} \right] \right) \end{aligned}$$

01.27.16.0157.01

$$\tanh^{-1}(x) + i \tan^{-1}(y) = \tanh^{-1}\left(\frac{x + iy}{1 + ix y}\right) - \pi i \left[\frac{-\arg(x + 1) - \arg(iy + 1) + \arg(ixy + 1) + \pi}{2\pi} \right] + i\pi \left[\frac{\arg(ixy + 1) - \arg(1 - x) - \arg(1 - iy) + \pi}{2\pi} \right]$$

Involving $\cot^{-1}(z)$

01.27.16.0158.01

$$\begin{aligned} \tanh^{-1}(x) + \cot^{-1}(y) &= i\pi \left[\frac{\arg(x + 1) - \arg(1 - x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{-\arg\left(\frac{(1-i/y)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left(1 + \frac{i}{y}\right)^{-i/2} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log\left(1 + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-i/y)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] \right) - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(1 - \frac{i}{y}\right)^{i/2} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right)}{2\pi} \right] \right) + \log\left(\frac{(1-i/y)^{i/2} \left(1 + \frac{i}{y}\right)^{-i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) \end{aligned}$$

01.27.16.0159.01

$$\begin{aligned} \tanh^{-1}(x) + \cot^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{-\arg\left(\frac{(1-i)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left(1 + \frac{i}{y}\right)^{-i/2} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log\left(1 + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-i)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] \right) - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(1 - \frac{i}{y}\right)^{i/2} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right)}{2\pi} \right] \right) + \\ &i\pi \left(\left[\frac{\arg\left(\frac{(1+i)^{-i/2} (1-i)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right] + \left[\frac{\frac{(1-i)^{i/2} (1+i)^{-i/2}}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{(1+i)^{-i/2} (1-i)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} + 1} \right] \right) + 2 \tanh^{-1} \left(\frac{\frac{(1-i)^{i/2} (1+i)^{-i/2}}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{(1+i)^{-i/2} (1-i)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} + 1} \right) \end{aligned}$$

01.27.16.0160.01

$$\tanh^{-1}(x) + i \cot^{-1}(y) = i \left(\tan^{-1}\left(\frac{-i - xy}{x - iy}\right) - \pi \left[\frac{-\arg(x+1) - \arg\left(1 + \frac{i}{y}\right) + \arg\left(\frac{ix}{y} + 1\right) + \pi}{2\pi} \right] + \pi \left[\frac{-\arg(1-x) + \arg\left(\frac{ix}{y} + 1\right) - \arg\left(1 - \frac{i}{y}\right) + \pi}{2\pi} \right] \right)$$

01.27.16.0161.01

$$\tanh^{-1}(x) + i \cot^{-1}(y) = \tanh^{-1}\left(\frac{1 - ixy}{x - iy}\right) - \pi i \left[\frac{-\arg(x+1) + \arg\left(\frac{ix}{y} + 1\right) - \arg\left(1 + \frac{i}{y}\right) + \pi}{2\pi} \right] + i\pi \left[\frac{\arg\left(\frac{ix}{y} + 1\right) - \arg(1-x) - \arg\left(1 - \frac{i}{y}\right) + \pi}{2\pi} \right]$$

Involving $\csc^{-1}(z)$

01.27.16.0162.01

$$\begin{aligned} \tanh^{-1}(x) + \csc^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) + \\ &\log\left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) \end{aligned}$$

01.27.16.0163.01

$$\begin{aligned} \tanh^{-1}(x) + \csc^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) + 1}{2\pi} \right] + \frac{1}{2}} \right) + 2 \tanh^{-1} \left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i} - 1}{\sqrt{\frac{1-x}{x+1}}} \right) \\ &\left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i} + 1}{\sqrt{\frac{1-x}{x+1}}} \right) \end{aligned}$$

01.27.16.0164.01

$$\begin{aligned} \tanh^{-1}(x) + i \operatorname{csc}^{-1}(y) = & -\frac{i \sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} \sin^{-1} \left(\frac{\frac{ix}{y} + \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}} \right) + \\ & \frac{\pi i \sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{2 \left(\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}} \right)} + \pi i \left[\frac{\sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}} \sqrt{1-x^2}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} + 1 \right] \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] - \\ & \pi i \left[\frac{\sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} - 1 \right] \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0165.01

$$\tanh^{-1}(x) + i \csc^{-1}(y) = \tanh^{-1} \left(\frac{(-1)^{\left\lfloor \frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-i x \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right\rfloor \sqrt{1-x^2} \sqrt{1-\frac{\left(\frac{-i x}{y} - \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{x}{y} - i \sqrt{1-\frac{1}{y^2}}} \right) + \frac{1}{2} i \pi$$

$$\left(\left(\left(\frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-i x \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right)}{1 + (-1)^{\left\lfloor \frac{\arg\left(\frac{i x+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2 \pi} \right\rfloor} + (-1)^{\left\lfloor -\frac{\arg(1-x^2)}{2 \pi} + \frac{\arg\left(\frac{-i x}{y} - \sqrt{1-\frac{1}{y^2}}\right)}{\pi} + \frac{1}{2} \right\rfloor} + \frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-i x \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right)}{+} \right)$$

$$\left((-1)^{\left\lfloor \frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-i x \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right\rfloor} - 2 \left(-1 + (-1)^{\left\lfloor \frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-i x \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right\rfloor} \right) \frac{1}{2} - \frac{\arg\left(\frac{i x+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2 \pi} \right)$$

Involving $\sec^{-1}(z)$

01.27.16.0166.01

$$\begin{aligned} \tanh^{-1}(x) + \sec^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)\right)}{2\pi} \right] \right) + \\ &\log\left(\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{\pi}{2} \end{aligned}$$

01.27.16.0167.01

$$\begin{aligned} \tanh^{-1}(x) + \sec^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)\right)}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right]} \right) + 2 \tanh^{-1} \left(\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i - 1}{\sqrt{\frac{1-x}{x+1}}} \right) + \frac{\pi}{2} \end{aligned}$$

01.27.16.0168.01

$$\begin{aligned} \tanh^{-1}(x) + i \sec^{-1}(y) &= \frac{\pi i}{2} - \frac{i \sqrt{1-x^2} \sqrt{\frac{(-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y})^2}{1-x^2}}}{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}} \sin^{-1} \left(\frac{\sqrt{1-\frac{1}{y^2}} - \frac{ix}{y}}{\sqrt{1-x^2}} \right) + \\ &\frac{i \pi \sqrt{1-x^2} \sqrt{\frac{(-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y})^2}{1-x^2}}}{2 \left(-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}\right)} + i \pi \left(\frac{\sqrt{\frac{(-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y})^2}{1-x^2}} \sqrt{1-x^2}}{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}} + 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] - \\ &i \pi \left(\frac{\sqrt{1-x^2} \sqrt{\frac{(-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y})^2}{1-x^2}}}{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}} - 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0169.01

$$\begin{aligned} \tanh^{-1}(x) + i \sec^{-1}(y) &= \frac{1}{2} i \pi \left(1 + 2 \left(1 + (-1) \left(\frac{\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi}}{\pi} \right) \right) \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] + \\ &\left(-1 \right) \left[\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(\frac{ix}{y} \sqrt{1-\frac{1}{y^2}}\right)}{\pi} + \frac{1}{2} \right] + \frac{1}{2} \left[\frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] + \frac{1}{2} \left[\frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] \\ &\left(-1 \right) \left[\frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] + (-1) \left[\frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] - \\ &\left(\left(\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right) \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] \end{aligned}$$

$$2 \left(-1 + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] \right)$$

$$\tanh^{-1} \left(\frac{(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-\frac{1}{y^2}}x-\frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] \sqrt{1-x^2} \sqrt{1-\frac{\left(\frac{ix}{y}-\sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{x}{y} + i\sqrt{1-\frac{1}{y^2}}} \right)$$

Involving $\sinh^{-1}(z)$

01.27.16.0170.01

$$\tanh^{-1}(x) + \sinh^{-1}(y) = \frac{\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2+2y\sqrt{y^2+1}x+y^2}{x^2-1}}}{\sqrt{y^2+1}x+y} \sin^{-1}\left(\frac{xy + \sqrt{y^2+1}}{\sqrt{1-x^2}}\right) -$$

$$i\pi \left(1 - \frac{i\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2+2y\sqrt{y^2+1}x+y^2}{x^2-1}}}{\sqrt{y^2+1}x+y} \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{y^2+1}-y\right)}{2\pi} \right] -$$

$$i\pi \left(1 + \frac{i\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2+2y\sqrt{y^2+1}x+y^2}{x^2-1}}}{\sqrt{y^2+1}x+y} \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{y^2+1}-y\right) - \pi}{2\pi} \right] -$$

$$\frac{\pi \sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2+2y\sqrt{y^2+1}x+y^2}{x^2-1}}}{2(\sqrt{y^2+1}x+y)}$$

01.27.16.0171.01

$$\sinh^{-1}(y) + \tanh^{-1}(x) = -\tanh^{-1} \left(\frac{i(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{y^2+1} ix+iy}{\sqrt{1-x^2}}\right)}{\pi} \right] \sqrt{1-x^2} \sqrt{1 - \frac{(-xy-\sqrt{y^2+1})^2}{1-x^2}}}{xy + \sqrt{y^2+1}} \right) -$$

$$\frac{1}{2} \pi i \left(2 \left(1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{y^2+1} ix+iy}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg(\sqrt{y^2+1} - y)}{2\pi} \right] + (-1)^{\left[-\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(-xy-\sqrt{y^2+1})}{\pi} + \frac{1}{2} \right]} \left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{y^2+1} ix+iy}{\sqrt{1-x^2}}\right)}{\pi} \right] \right) +$$

$$(-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{y^2+1} ix+iy}{\sqrt{1-x^2}}\right)}{\pi} \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{y^2+1} ix+iy}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg(\sqrt{y^2+1} - y)}{2\pi} \right]$$

Involving $\cosh^{-1}(z)$

01.27.16.0172.01

$$\tanh^{-1}(x) + \cosh^{-1}(y) = \tanh^{-1} \left(\frac{(-1)^{\left[-\frac{1}{2} \frac{\arg \left(\frac{\sqrt{y-1} \sqrt{y+1} x+y}{\sqrt{1-x^2}} \right) \right]} \sqrt{1-x^2} \sqrt{1 - \frac{(ixy+i\sqrt{y-1}\sqrt{y+1})^2}{1-x^2}}}{xy + \sqrt{y-1}\sqrt{y+1}} \right) -$$

$$\frac{1}{2} i (-1)^{\left[-\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(ixy+i\sqrt{y-1}\sqrt{y+1})}{\pi} + \frac{1}{2} \right] + \left[\frac{1}{2} \frac{\arg \left(\frac{\sqrt{y-1} \sqrt{y+1} x+y}{\sqrt{1-x^2}} \right) \right]} \pi -$$

$$\frac{1}{4} \left(1 + (-1)^{\left[-\frac{\arg(1-y)}{2\pi} \right]} \right) \pi i \left(2 \left(1 + (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{i\sqrt{1-y^2} x+y}{\sqrt{1-x^2}} \right) \right]} \right) \left[\frac{\arg \left(\frac{i-i x}{\sqrt{1-x^2}} \right) + \arg(i y + \sqrt{1-y^2})}{2\pi} \right] + \right.$$

$$\left. (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{i\sqrt{1-y^2} x+y}{\sqrt{1-x^2}} \right) \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{i\sqrt{1-y^2} x+y}{\sqrt{1-x^2}} \right) \right]} \right) \left[\frac{1}{2} - \frac{\arg \left(\frac{i-i x}{\sqrt{1-x^2}} \right) + \arg(i y + \sqrt{1-y^2})}{2\pi} \right] - 1 \right) +$$

$$\frac{1}{4} \left(1 - (-1)^{\left[-\frac{\arg(1-y)}{2\pi} \right]} \right) \pi i \left(2 \left(1 + (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{y-i x \sqrt{1-y^2}}{\sqrt{1-x^2}} \right) \right]} \right) \left[\frac{\arg \left(\frac{i x+i}{\sqrt{1-x^2}} \right) + \arg(i y + \sqrt{1-y^2})}{2\pi} \right] + \right.$$

$$\left. (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{y-i x \sqrt{1-y^2}}{\sqrt{1-x^2}} \right) \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} \frac{\arg \left(\frac{y-i x \sqrt{1-y^2}}{\sqrt{1-x^2}} \right) \right]} \right) \left[\frac{1}{2} - \frac{\arg \left(\frac{i x+i}{\sqrt{1-x^2}} \right) + \arg(i y + \sqrt{1-y^2})}{2\pi} \right] - 1 \right)$$

Involving $\coth^{-1}(z)$

01.27.16.0010.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) - \frac{\pi i}{2} \operatorname{sgn}(xy+1)(1 - \operatorname{sgn}(x+y)) /; y > 1 \vee |x| < 1 \wedge y > 0 \vee x > 1 \wedge -1 < y < 0$$

01.27.16.0011.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) + \frac{\pi i}{2} (\operatorname{sgn}(x+y) + 1) \operatorname{sgn}(xy+1) /; (y < -1 \vee |x| < 1 \wedge y < 0) \vee x < -1 \wedge 0 < y < 1$$

01.27.16.0012.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) - \pi i \operatorname{sgn}\left(\frac{xy+1}{x+y}\right) /; x > 1 \wedge 0 < y < 1 \vee x < -1 \wedge -1 < y < 0$$

01.27.16.0013.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) + \frac{\pi i}{2} (\operatorname{sgn}(x+y) + 1) \operatorname{sgn}(xy+1) /; (y > 1 \vee |x| < 1 \wedge y > 0) \vee x < -1 \wedge -1 < y < 0$$

01.27.16.0014.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) - \frac{\pi i}{2} \operatorname{sgn}(xy+1)(1 - \operatorname{sgn}(x+y)) /; y < -1 \vee |x| < 1 \wedge y < 0 \vee x > 1 \wedge 0 < y < 1$$

01.27.16.0015.01

$$\tanh^{-1}(x) + \coth^{-1}(y) = \tanh^{-1}\left(\frac{xy+1}{x+y}\right) - \pi i \operatorname{sgn}\left(\frac{xy+1}{x+y}\right) /; x > 1 \wedge -1 < y < 0 \vee x < -1 \wedge 0 < y < 1$$

01.27.16.0173.01

$$\begin{aligned} \tanh^{-1}(x) + \coth^{-1}(y) = \\ \tanh^{-1}\left(\frac{xy+1}{x+y}\right) - i\pi \left[\frac{-\arg(x+1) - \arg\left(1 + \frac{1}{y}\right) + \arg\left(\frac{x}{y} + 1\right) + \pi}{2\pi} \right] + i\pi \left[\frac{-\arg(1-x) + \arg\left(\frac{x}{y} + 1\right) - \arg\left(1 - \frac{1}{y}\right) + \pi}{2\pi} \right] \end{aligned}$$

Involving $\operatorname{csch}^{-1}(z)$

01.27.16.0174.01

$$\operatorname{csch}^{-1}(y) + \operatorname{tanh}^{-1}(x) = \frac{i \sqrt{1-x^2} \sqrt{\frac{\left(i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}\right)^2}{1-x^2}}}{i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}} \sin^{-1} \left(\frac{\frac{x}{y} + \sqrt{1+\frac{1}{y^2}}}{\sqrt{1-x^2}} \right) -$$

$$\frac{i \pi \sqrt{1-x^2} \sqrt{\frac{\left(i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}\right)^2}{1-x^2}}}{2 \left(i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}\right)} - \pi i \left(\frac{\sqrt{\frac{\left(i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}\right)^2}{1-x^2}} \sqrt{1-x^2}}{i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}} + 1 \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} - \frac{1}{y}\right)}{2 \pi} \right] +$$

$$\pi i \left(\frac{\sqrt{1-x^2} \sqrt{\frac{\left(i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}\right)^2}{1-x^2}}}{i x \sqrt{1+\frac{1}{y^2}} + \frac{i}{y}} - 1 \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} - \frac{1}{y}\right) - \pi}{2 \pi} \right]$$

01.27.16.0175.01

$$\tanh^{-1}(x) + \operatorname{csch}^{-1}(y) = -\tanh^{-1} \left(\frac{i(-1) \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1 + \frac{1}{y^2}} x + \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \sqrt{1 - \frac{\left(-\frac{x}{y} - \sqrt{1 + \frac{1}{y^2}} \right)^2}{1-x^2}} \right]}{\frac{x}{y} + \sqrt{1 + \frac{1}{y^2}}} \right) -$$

$$\frac{1}{2} \pi i \left(2 \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1 + \frac{1}{y^2}} x + \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] + (-1) \left[\frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1 + \frac{1}{y^2}} - \frac{1}{y} \right)}{2\pi} \right] + (-1) \left[\frac{-\frac{\operatorname{arg}(1-x^2)}{2\pi} + \frac{\operatorname{arg} \left(-\frac{x}{y} \sqrt{1 + \frac{1}{y^2}} \right)}{\pi} + \frac{1}{2}}{\sqrt{1-x^2}} \right] + \frac{1}{2} \left[\frac{\operatorname{arg} \left(\frac{i \sqrt{1 + \frac{1}{y^2}} x + \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi} \right] \right) +$$

$$(-1) \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1 + \frac{1}{y^2}} x + \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] - 2 \left(-1 + (-1) \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1 + \frac{1}{y^2}} x + \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] + \frac{1}{2} \left[\frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1 + \frac{1}{y^2}} - \frac{1}{y} \right)}{2\pi} \right] \right)$$

Involving $\operatorname{sech}^{-1}(z)$

01.27.16.0176.01

$$\tanh^{-1}(x) + \operatorname{sech}^{-1}(y) = \tanh^{-1} \left(\frac{(-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}} x + \frac{1}{y}}{\sqrt{1-x^2}} \right)}{\pi} \right]} \sqrt{1-x^2} \sqrt{\frac{\left(\frac{x}{y} + \sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}} \right)^2}{1-x^2}} + 1}{\frac{x}{y} + \sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}}} \right)$$

$$\frac{1}{2} i (-1)^{\left[\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(i \sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}} + \frac{ix}{y} \right)}{\pi} + \frac{1}{2} \right] + \frac{1}{2} - \frac{\arg\left(\frac{\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}} x + \frac{1}{y}}{\sqrt{1-x^2}} \right)}{\pi} \right]} \pi -$$

$$\frac{1}{4} \left(1 + (-1)^{\left[-\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi} \right]} \right) \pi i \left(2 \left(1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{i \sqrt{1-\frac{1}{y^2}} x + \frac{1}{y}}{\sqrt{1-x^2}} \right)}{\pi} \right]} \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y} \right)}{2\pi} \right] + \right)$$

$$\begin{aligned}
 & \left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i\sqrt{1-\frac{1}{y^2}}x+\frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi}\right\rfloor} - 2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{i\sqrt{1-\frac{1}{y^2}}x+\frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi}\right\rfloor} \right) \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{i-x}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] - 1 + \\
 & \left(\frac{1}{4} \left(1 - (-1)^{\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor} \right) \pi i \right) \left(2 \left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}\right\rfloor} \right) \right) \left[\frac{\arg\left(\frac{i x+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] + \\
 & \left((-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}\right\rfloor} - 2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}\right\rfloor} \right) \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{i x+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] - 1
 \end{aligned}$$

Differences involving the direct function

Involving log(z)

01.27.16.0177.01

$$\tanh^{-1}(x) - \log(y) = i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\frac{1}{y}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Im}(\log(y)) + \pi}{2\pi} \right] \right) + \log\left(\frac{1}{\sqrt{\frac{1-x}{x+1}} y}\right)$$

01.27.16.0178.01

$$\tanh^{-1}(x) - \log(y) = i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\frac{1}{y}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Im}(\log(y)) + \pi}{2\pi} \right] \right) + i\pi \left(\left[\frac{\arg\left(1 + \frac{1}{y \sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right] + \frac{1}{2} \right) + 2 \tanh^{-1}\left(\frac{1}{1 + \frac{1}{y \sqrt{\frac{1-x}{x+1}}}}\right)$$

Involving $\sin^{-1}(z)$

01.27.16.0179.01

$$\tanh^{-1}(x) - \sin^{-1}(y) = i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^i\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) + \log\left(\frac{\left(iy + \sqrt{1-y^2}\right)^i}{\sqrt{\frac{1-x}{x+1}}}\right)$$

01.27.16.0180.01

$$\begin{aligned} \tanh^{-1}(x) - \sin^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) + \\ &i\pi \left(\left[\frac{\arg\left(\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right] + 2 \tanh^{-1} \left(\frac{\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{(iy + \sqrt{1-y^2})^i}{\sqrt{\frac{1-x}{x+1}}} + 1} \right) \right) \end{aligned}$$

01.27.16.0181.01

$$\begin{aligned} \tanh^{-1}(x) - i \sin^{-1}(y) &= \frac{i\sqrt{1-x^2} \sqrt{\frac{(-i\sqrt{1-y^2}-x-y)^2}{1-x^2}}}{i\sqrt{1-y^2} x+y} \sin^{-1} \left(\frac{\sqrt{1-y^2} - ixy}{\sqrt{1-x^2}} \right) + \\ &\frac{i\pi\sqrt{1-x^2} \sqrt{\frac{(-i\sqrt{1-y^2}-x-y)^2}{1-x^2}}}{2(-i\sqrt{1-y^2} x-y)} + i\pi \left(\frac{\sqrt{\frac{(-i\sqrt{1-y^2}-x-y)^2}{1-x^2}} \sqrt{1-x^2}}{-i\sqrt{1-y^2} x-y} + 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg(\sqrt{1-y^2} - iy)}{2\pi} \right] - \\ &i\pi \left(\frac{\sqrt{1-x^2} \sqrt{\frac{(-i\sqrt{1-y^2}-x-y)^2}{1-x^2}}}{-i\sqrt{1-y^2} x-y} - 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg(\sqrt{1-y^2} - iy) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0182.01

$$\begin{aligned} \tanh^{-1}(x) - i \sin^{-1}(y) &= \frac{1}{2} i \pi \left(2 \left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg(\sqrt{1-y^2} - iy)}{2\pi} \right] + \right. \\ &(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \left. + (-1)^{\left\lfloor -\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(ixy - \sqrt{1-y^2})}{\pi} \right\rfloor} + \frac{1}{2} \right) \left[\frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{2} \right] - \\ &2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg(\sqrt{1-y^2} - iy)}{2\pi} \right] - \\ &\tanh^{-1} \left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\arg\left(\frac{-i\sqrt{1-y^2} - x - y}{\sqrt{1-x^2}}\right)}{\pi} \right\rfloor} \sqrt{1-x^2} \sqrt{1 - \frac{(ixy - \sqrt{1-y^2})^2}{1-x^2}}}{xy + i\sqrt{1-y^2}} \right) \end{aligned}$$

Involving $\cos^{-1}(z)$

01.27.16.0183.01

$$\begin{aligned} \tanh^{-1}(x) - \cos^{-1}(y) &= i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2 i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right] \right) + \\ &\log \left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}} \right) - \frac{\pi}{2} \end{aligned}$$

01.27.16.0184.01

$$\begin{aligned} \tanh^{-1}(x) - \cos^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(iy + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right] \right) \\ &\log\left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) i\pi \left(1 - (-1)^{\left(\left[\frac{\arg\left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) + \pi}{2\pi} \right] + \frac{1}{2}} \right)} \right) + 2 \tanh^{-1}\left(\frac{\left(iy + \sqrt{1-y^2}\right)^{-i} - 1}{\frac{\sqrt{\frac{1-x}{x+1}}}{\left(iy + \sqrt{1-y^2}\right)^i + 1}}\right) - \frac{\pi}{2} \end{aligned}$$

01.27.16.0185.01

$$\begin{aligned} \tanh^{-1}(x) - i\cos^{-1}(y) &= -\frac{\pi i}{2} - \frac{i\sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{y-ix\sqrt{1-y^2}} \sin^{-1}\left(\frac{ixy + \sqrt{1-y^2}}{\sqrt{1-x^2}}\right) + \\ &\frac{\pi i \sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{2(y-ix\sqrt{1-y^2})} + \pi i \left(\frac{\sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}} \sqrt{1-x^2}}{y-ix\sqrt{1-y^2}} + 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] - \\ &\pi i \left(\frac{\sqrt{1-x^2} \sqrt{\frac{(y-ix\sqrt{1-y^2})^2}{1-x^2}}}{y-ix\sqrt{1-y^2}} - 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0186.01

$$\tanh^{-1}(x) - i \cos^{-1}(y) = \tanh^{-1} \left(\frac{(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] \sqrt{1-x^2} \sqrt{1 - \frac{(-ixy - \sqrt{1-y^2})^2}{1-x^2}}}{xy - i\sqrt{1-y^2}} \right) +$$

$$\frac{1}{2} i \pi \left(-1 + 2 \left[1 + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] \right] \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right) +$$

$$(-1) \left[\frac{\arg(1-x^2)}{2\pi} + \frac{\arg(-ixy - \sqrt{1-y^2})}{\pi} + \frac{1}{2} \right] + \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] -$$

$$2 \left(-1 + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right] \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right]$$

Involving $\tan^{-1}(z)$

01.27.16.0187.01

$$\tanh^{-1}(x) - \tan^{-1}(y) = i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left((1-iy)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log(1-iy)\right) + \pi}{2\pi} \right] \right) - 2 i \pi$$

$$\left(\left[\frac{-\arg\left(\frac{(1-iy)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg((iy+1)^{i/2}) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-iy)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log(iy+1)\right)}{2\pi} \right] + \log\left(\frac{(1-iy)^{-\frac{i}{2}} (iy+1)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) \right)$$

01.27.16.0188.01

$$\begin{aligned} \tanh^{-1}(x) - \tan^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left((1-iy)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log(1-iy)\right) + \pi}{2\pi} \right] \right) - \\ &2i\pi \left(\left[\frac{-\arg\left(\frac{(1-iy)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg((iy+1)^{i/2}) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{(1-iy)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log(iy+1)\right)}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left(\frac{\arg\left(\frac{(1-iy)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) + \frac{1}{2}}{2\pi} \right)} \right) + 2 \tanh^{-1} \left(\frac{\frac{(1-iy)^{-\frac{i}{2}} (iy+1)^{i/2} - 1}{\sqrt{\frac{1-x}{x+1}}}}{\frac{(1-iy)^{-\frac{i}{2}} (iy+1)^{i/2} + 1}{\sqrt{\frac{1-x}{x+1}}}} \right) \operatorname{og} \left(\frac{(1-iy)^{-\frac{i}{2}} (iy+1)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} \right) \end{aligned}$$

01.27.16.0189.01

$$\begin{aligned} \tanh^{-1}(x) - i \tan^{-1}(y) &= \\ -i \left(\tan^{-1}\left(\frac{iy-x}{i+xy}\right) - \pi \left[\frac{-\arg(1-x) - \arg(iy+1) + \arg(1-ixy) + \pi}{2\pi} \right] + \pi \left[\frac{-\arg(x+1) - \arg(1-iy) + \arg(1-ixy) + \pi}{2\pi} \right] \right) \end{aligned}$$

01.27.16.0190.01

$$\begin{aligned} \tanh^{-1}(x) - i \tan^{-1}(y) &= \\ \tanh^{-1}\left(\frac{x-iy}{1-ixy}\right) + i\pi \left[\frac{-\arg(1-x) - \arg(iy+1) + \arg(1-ixy) + \pi}{2\pi} \right] - \pi i \left[\frac{-\arg(x+1) - \arg(1-iy) + \arg(1-ixy) + \pi}{2\pi} \right] \end{aligned}$$

Involving $\cot^{-1}(z)$

01.27.16.0191.01

$$\tanh^{-1}(x) - \cot^{-1}(y) =$$

$$i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) -$$

$$2i\pi \left(\left[\frac{-\arg\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left(\left(1 + \frac{i}{y}\right)^{i/2}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log\left(1 + \frac{i}{y}\right)\right)}{2\pi} \right] + \log\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}} \left(1 + \frac{i}{y}\right)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) \right)$$

01.27.16.0192.01

$$\tanh^{-1}(x) - \cot^{-1}(y) =$$

$$i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}\left(\log\left(1 - \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) -$$

$$2i\pi \left(\left[\frac{-\arg\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right) - \arg\left(\left(1 + \frac{i}{y}\right)^{i/2}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}}}{\sqrt{\frac{1-x}{x+1}}}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}\left(\log\left(1 + \frac{i}{y}\right)\right)}{2\pi} \right] + \right.$$

$$\left. i\pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}} \left(1 + \frac{i}{y}\right)^{i/2}}{\sqrt{\frac{1-x}{x+1}}}\right) + 1}{2\pi} \right\rfloor + \frac{1}{2}} \right) + 2 \tanh^{-1}\left(\frac{\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}} \left(1 + \frac{i}{y}\right)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} - 1}{\frac{\left(1 - \frac{i}{y}\right)^{-\frac{i}{2}} \left(1 + \frac{i}{y}\right)^{i/2}}{\sqrt{\frac{1-x}{x+1}}} + 1}\right) \right)$$

01.27.16.0192.01

$$\tanh^{-1}(x) - i \cot^{-1}(y) =$$

$$-i \left(\tan^{-1} \left(\frac{i - xy}{x + iy} \right) - \pi \left[\frac{-\arg(1-x) - \arg\left(1 + \frac{i}{y}\right) + \arg\left(1 - \frac{ix}{y}\right) + \pi}{2\pi} \right] + \pi \left[\frac{-\arg(x+1) - \arg\left(1 - \frac{i}{y}\right) + \arg\left(1 - \frac{ix}{y}\right) + \pi}{2\pi} \right] \right)$$

01.27.16.0193.01

$$\tanh^{-1}(x) - i \cot^{-1}(y) =$$

$$\tanh^{-1} \left(\frac{1 + ixy}{x + iy} \right) + i\pi \left[\frac{-\arg(1-x) - \arg\left(1 + \frac{i}{y}\right) + \arg\left(1 - \frac{ix}{y}\right) + \pi}{2\pi} \right] - \pi i \left[\frac{-\arg(x+1) - \arg\left(1 - \frac{i}{y}\right) + \arg\left(1 - \frac{ix}{y}\right) + \pi}{2\pi} \right]$$

Involving $\csc^{-1}(z)$

01.27.16.0194.01

$$\tanh^{-1}(x) - \csc^{-1}(y) = i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(\sqrt{1 - \frac{1}{y^2}} + \frac{i}{y}\right)^i\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(\sqrt{1 - \frac{1}{y^2}} + \frac{i}{y}\right)\right)}{2\pi} \right] \right) +$$

$$\log \left(\frac{\left(\sqrt{1 - \frac{1}{y^2}} + \frac{i}{y}\right)^i}{\sqrt{\frac{1-x}{x+1}}} \right)$$

01.27.16.0195.01

$$\begin{aligned} \tanh^{-1}(x) - \csc^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(\log\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)\right)}{2\pi} \right] \right) + \\ &i\pi \left(\left[\frac{\arg\left(\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i}{\sqrt{\frac{1-x}{x+1}} + 1}\right) + \frac{1}{2}}{2\pi} \right] + 2 \tanh^{-1}\left(\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i - 1}{\sqrt{\frac{1-x}{x+1}}}\right) \right. \\ &\left. - (-1) \left[\frac{\left(\sqrt{1 - \frac{1}{y^2} + \frac{i}{y}}\right)^i + 1}{\sqrt{\frac{1-x}{x+1}}} \right] \right) \end{aligned}$$

01.27.16.0196.01

$$\begin{aligned} \tanh^{-1}(x) - i \csc^{-1}(y) &= -\frac{i\sqrt{1-x^2} \sqrt{\frac{\left(-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}\right)^2}{1-x^2}}}{-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}} \sin^{-1}\left(\frac{\sqrt{1-\frac{1}{y^2}} - \frac{ix}{y}}{\sqrt{1-x^2}}\right) + \\ &\frac{i\pi\sqrt{1-x^2} \sqrt{\frac{\left(-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}\right)^2}{1-x^2}}}{2\left(-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}\right)} + i\pi \left(\frac{\sqrt{\frac{\left(-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}\right)^2}{1-x^2}} \sqrt{1-x^2}}{-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}} + 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] - \\ &i\pi \left(\frac{\sqrt{1-x^2} \sqrt{\frac{\left(-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}\right)^2}{1-x^2}}}{-i\sqrt{1-\frac{1}{y^2}}x - \frac{1}{y}} - 1 \right) \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0197.01

$\tanh^{-1}(x) - i \csc^{-1}(y) =$

$$\frac{1}{2} i \pi \left(2 \left[\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] + (-1) \left[\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(\frac{ix}{y} - \sqrt{1-\frac{1}{y^2}}\right)}{\pi} + \frac{1}{2} \right] + \frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] +$$

$$(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] - 2 \left[\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} - \frac{i}{y}\right)}{2\pi} \right] -$$

$$\tanh^{-1} \left(\frac{(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{-i \sqrt{1-\frac{1}{y^2}} x - \frac{1}{y}}{\sqrt{1-x^2}}\right)}{\pi} \right] \sqrt{1-x^2} \sqrt{1 - \frac{\left(\frac{ix}{y} - \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{x}{y} + i \sqrt{1-\frac{1}{y^2}}} \right)$$

Involving $\sec^{-1}(z)$

01.27.16.0198.01

$$\begin{aligned} \tanh^{-1}(x) - \sec^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) + \\ &\log\left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) - \frac{\pi}{2} \end{aligned}$$

01.27.16.0199.01

$$\begin{aligned} \tanh^{-1}(x) - \sec^{-1}(y) &= i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\ &2i\pi \left(\left[\frac{\frac{1}{2} \arg\left(\frac{1-x}{x+1}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(\log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) + \\ &i\pi \left(1 - (-1)^{\left[\frac{\arg\left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}}{\sqrt{\frac{1-x}{x+1}}}\right) + 1}{2\pi} \right] + \frac{1}{2}} \right) + 2 \tanh^{-1} \left(\frac{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i} - 1}{\sqrt{\frac{1-x}{x+1}}} \right) - \frac{\pi}{2} \end{aligned}$$

01.27.16.0200.01

$$\begin{aligned} \tanh^{-1}(x) - i \sec^{-1}(y) &= -\frac{\pi i}{2} - \frac{i \sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} \sin^{-1} \left(\frac{\frac{ix}{y} + \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}} \right) + \\ &\frac{\pi i \sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{2 \left(\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}} \right)} + \pi i \left[\frac{\sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}} \sqrt{1-x^2}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} + 1 \right] \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] - \\ &\pi i \left[\frac{\sqrt{1-x^2} \sqrt{\frac{\left(\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{1}{y} - ix \sqrt{1-\frac{1}{y^2}}} - 1 \right] \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0201.01

$$\begin{aligned} \tanh^{-1}(x) - i \sec^{-1}(y) &= \tanh^{-1} \left(\frac{(-1) \left[\frac{\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}} \right] \sqrt{1-x^2} \sqrt{1-\frac{\left(\frac{ix}{y} \sqrt{1-\frac{1}{y^2}}\right)^2}{1-x^2}}}{\frac{x}{y} - i \sqrt{1-\frac{1}{y^2}}} \right) + \\ &\frac{1}{2} i \pi \left[-1 + 2 \left[1 + (-1) \left[\frac{\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}} \right] \right] \right] \left[\frac{\arg\left(\frac{i+ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] + \end{aligned}$$

$$\begin{aligned}
 & \left(\left(\right) \right) \\
 & \left(-1 \right) \left[\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(\frac{ix}{y} \sqrt{1-\frac{1}{y^2}}\right)}{\pi} + \frac{1}{2} \right] + \left[\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi} \right] + \left[\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi} \right] - \\
 & \left(-1 + (-1) \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{\frac{1-ix}{y} \sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi} \right] + \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right]
 \end{aligned}$$

Involving $\sinh^{-1}(z)$

01.27.16.0202.01

$$\begin{aligned}
 \tanh^{-1}(x) - \sinh^{-1}(y) &= \frac{\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2 - 2y\sqrt{y^2+1} - x + y^2}{x^2-1}}}{x\sqrt{y^2+1} - y} \sin^{-1}\left(\frac{\sqrt{y^2+1} - xy}{\sqrt{1-x^2}}\right) - \\
 & i\pi \left[1 - \frac{i\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2 - 2y\sqrt{y^2+1} - x + y^2}{x^2-1}}}{x\sqrt{y^2+1} - y} \right] \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg(y + \sqrt{y^2+1})}{2\pi} \right] - \\
 & i\pi \left[1 + \frac{i\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2 - 2y\sqrt{y^2+1} - x + y^2}{x^2-1}}}{x\sqrt{y^2+1} - y} \right] \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg(y + \sqrt{y^2+1}) - \pi}{2\pi} \right] - \\
 & \frac{\pi\sqrt{1-x^2} \sqrt{\frac{(y^2+1)x^2 - 2y\sqrt{y^2+1} - x + y^2}{x^2-1}}}{2(x\sqrt{y^2+1} - y)}
 \end{aligned}$$

01.27.16.0203.01

$$\tanh^{-1}(x) - \sinh^{-1}(y) = \tanh^{-1} \left(\frac{i(-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix\sqrt{y^2+1}-iy}{\sqrt{1-x^2}}\right)}{\pi} \right] \sqrt{1-x^2} \sqrt{1 - \frac{(xy - \sqrt{y^2+1})^2}{1-x^2}}}{xy - \sqrt{y^2+1}} \right) -$$

$$\frac{1}{2} i \pi \left(2 \left(1 + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix\sqrt{y^2+1}-iy}{\sqrt{1-x^2}}\right)}{\pi} \right] \right) \left[\frac{\arg\left(y + \sqrt{y^2+1}\right) + \arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right)}{2\pi} \right] + \right.$$

$$\left. (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix\sqrt{y^2+1}-iy}{\sqrt{1-x^2}}\right)}{\pi} \right] + (-1) \left[\frac{\arg(xy - \sqrt{y^2+1})}{\pi} + \frac{1}{2} - \frac{\arg(1-x^2)}{2\pi} \right] + \left[\frac{1}{2} - \frac{\arg\left(\frac{ix\sqrt{y^2+1}-iy}{\sqrt{1-x^2}}\right)}{\pi} \right] - \right.$$

$$\left. 2 \left(-1 + (-1) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix\sqrt{y^2+1}-iy}{\sqrt{1-x^2}}\right)}{\pi} \right] \right) \left[\frac{1}{2} - \frac{\arg\left(y + \sqrt{y^2+1}\right) + \arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right)}{2\pi} \right] \right)$$

Involving $\cosh^{-1}(z)$

01.27.16.0204.01

$$\begin{aligned} \tanh^{-1}(x) - \cosh^{-1}(y) = \tanh^{-1} & \left(\frac{(-1)^{\left[-\frac{1}{2} - \frac{\arg\left(\frac{y-x\sqrt{y-1}\sqrt{y+1}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \sqrt{1-x^2} \sqrt{1 - \frac{(i\sqrt{y-1}\sqrt{y+1} - ix)^2}{1-x^2}}}{xy - \sqrt{y-1}\sqrt{y+1}} \right) - \\ & \frac{1}{4} i \left(1 - (-1)^{\left[-\frac{\arg(1-y)}{2\pi} \right]} \right) \pi \left(2 \left(1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{i\sqrt{1-y^2}x+y}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] + \right. \\ & \left. (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{i\sqrt{1-y^2}x+y}{\sqrt{1-x^2}}\right)}{\pi} \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{i\sqrt{1-y^2}x+y}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] - 1 \right) + \\ & \frac{1}{4} i \left(1 + (-1)^{\left[-\frac{\arg(1-y)}{2\pi} \right]} \right) \pi \left(2 \left(1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] + \right. \\ & \left. (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} - 2 \left(-1 + (-1)^{\left[\frac{1}{2} - \frac{\arg\left(\frac{y-ix\sqrt{1-y^2}}{\sqrt{1-x^2}}\right)}{\pi} \right]} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(iy + \sqrt{1-y^2}\right)}{2\pi} \right] - 1 \right) + \\ & \frac{1}{2} i (-1)^{\left[-\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(i\sqrt{y-1}\sqrt{y+1} - ix\right)}{\pi} \right] + \frac{1}{2}} \left[\frac{1}{2} - \frac{\arg\left(\frac{y-x\sqrt{y-1}\sqrt{y+1}}{\sqrt{1-x^2}}\right)}{\pi} \right] \pi \end{aligned}$$

Involving $\coth^{-1}(z)$

01.27.16.0205.01

$$\tanh^{-1}(x) - \coth^{-1}(y) =$$

$$\tanh^{-1}\left(\frac{1-x}{x-y}\right) + i\pi \left[\frac{-\arg(1-x) - \arg\left(1 + \frac{1}{y}\right) + \arg\left(1 - \frac{x}{y}\right) + \pi}{2\pi} \right] - \pi i \left[\frac{-\arg(x+1) - \arg\left(1 - \frac{1}{y}\right) + \arg\left(1 - \frac{x}{y}\right) + \pi}{2\pi} \right]$$

Involving $\operatorname{csch}^{-1}(z)$

01.27.16.0206.01

$$\begin{aligned} \tanh^{-1}(x) - \operatorname{csch}^{-1}(y) &= \frac{i\sqrt{1-x^2} \sqrt{\frac{\left(ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}\right)^2}{1-x^2}}}{ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}} \sin^{-1}\left(\frac{\sqrt{1+\frac{1}{y^2}} - \frac{x}{y}}{\sqrt{1-x^2}}\right) - \\ &\frac{i\pi\sqrt{1-x^2} \sqrt{\frac{\left(ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}\right)^2}{1-x^2}}}{2\left(ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}\right)} - i\pi \left[\frac{\sqrt{\frac{\left(ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}\right)^2}{1-x^2}} \sqrt{1-x^2}}{ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}} + 1 \right] \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} + \frac{1}{y}\right)}{2\pi} \right] + \\ &i\pi \left[\frac{\sqrt{1-x^2} \sqrt{\frac{\left(ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}\right)^2}{1-x^2}}}{ix\sqrt{1+\frac{1}{y^2}} - \frac{i}{y}} - 1 \right] \left[\frac{\arg\left(\frac{i-ix}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1+\frac{1}{y^2}} + \frac{1}{y}\right) - \pi}{2\pi} \right] \end{aligned}$$

01.27.16.0207.01

$$\tanh^{-1}(x) - \operatorname{csch}^{-1}(y) = \tanh^{-1} \left(\frac{i(-1) \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{ix \sqrt{1 + \frac{1}{y^2}} - \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \sqrt{1-x^2} \sqrt{1 - \frac{\left(\frac{x}{y} - \sqrt{1 + \frac{1}{y^2}} \right)^2}{1-x^2}} \right]}{\frac{x}{y} - \sqrt{1 + \frac{1}{y^2}}} \right)}$$

$$\frac{1}{2} i \pi \left(2 \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{ix \sqrt{1 + \frac{1}{y^2}} - \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] + (-1) \left[\frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y} \right)}{2\pi} \right] + (-1) \left[\frac{-\frac{\operatorname{arg}(1-x^2)}{2\pi} + \frac{\operatorname{arg} \left(\frac{x}{y} - \sqrt{1 + \frac{1}{y^2}} \right)}{\pi} + \frac{1}{2}}{\sqrt{1-x^2}} \right] + \frac{1}{2} \left[\frac{\operatorname{arg} \left(\frac{ix \sqrt{1 + \frac{1}{y^2}} - \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi} \right] \right)$$

$$(-1) \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{ix \sqrt{1 + \frac{1}{y^2}} - \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] - 2 \left[\frac{\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{ix \sqrt{1 + \frac{1}{y^2}} - \frac{i}{y}}{\sqrt{1-x^2}} \right)}{\pi}}{\sqrt{1-x^2}} \right] + \frac{1}{2} \left[\frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y} \right)}{2\pi} \right]$$

Involving $\operatorname{sech}^{-1}(z)$

01.27.16.0208.01

$$\tanh^{-1}(x) - \operatorname{sech}^{-1}(y) = \tanh^{-1} \left(\frac{(-1)^{\left\lfloor \frac{1}{2} - \frac{\operatorname{arg} \left(\frac{\frac{1-x}{y} \sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}}}{\sqrt{1-x^2}} \right)}{\pi} \right\rfloor} \sqrt{1-x^2} \sqrt{\frac{\left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}} - \frac{x}{y} \right)^2}{1-x^2}} + 1}}{\frac{x}{y} - \sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}}} \right)}$$

$$\frac{1}{4} i \left(1 - (-1)^{\left\lfloor \frac{\operatorname{arg} \left(1 - \frac{1}{y} \right)}{2\pi} \right\rfloor} \right) \pi \left(2 \left(1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1-\frac{1}{y^2}} - \frac{x+\frac{1}{y}}}{\sqrt{1-x^2}} \right)}{\pi} \right\rfloor} \right) \left[\frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y} \right)}{2\pi} \right] \right) +$$

$$\left((-1)^{\left\lfloor \frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1-\frac{1}{y^2}} - \frac{x+\frac{1}{y}}}{\sqrt{1-x^2}} \right)}{\pi} \right\rfloor} \right) - 2 \left(-1 + (-1)^{\left\lfloor \frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i \sqrt{1-\frac{1}{y^2}} - \frac{x+\frac{1}{y}}}{\sqrt{1-x^2}} \right)}{\pi} \right\rfloor} \right) \left[\frac{1}{2} - \frac{\operatorname{arg} \left(\frac{i-ix}{\sqrt{1-x^2}} \right) + \operatorname{arg} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y} \right)}{2\pi} \right] - 1 \right) +$$

$$\frac{1}{4} i \left(1 + (-1)^{\left[-\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi} \right]} \right) \pi \left(2 \left(1 + (-1)^{\left[\frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right]} \right) \left[\frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] \right) +$$

$$(-1)^{\left[\frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right]} - 2 \left(-1 + (-1)^{\left[\frac{\frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-ix\sqrt{1-\frac{1}{y^2}}}{\sqrt{1-x^2}}\right)}{\pi}}{2} \right]} \right) \left[\frac{1}{2} - \frac{\arg\left(\frac{ix+i}{\sqrt{1-x^2}}\right) + \arg\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)}{2\pi} \right] - 1 \right) +$$

$$\frac{1}{2} i (-1)^{\left[-\frac{\arg(1-x^2)}{2\pi} + \frac{\arg\left(i\sqrt{\frac{1}{y}-1}\sqrt{1+\frac{1}{y}}-\frac{ix}{y}\right)}{\pi} + \frac{1}{2} \right]} \left[\frac{1}{2} - \frac{\arg\left(\frac{\frac{1}{y}-x\sqrt{\frac{1}{y}-1}\sqrt{1+\frac{1}{y}}}{\sqrt{1-x^2}}\right)}{\pi} \right] \pi$$

Linear combinations involving the direct function

Involving log(z)

01.27.16.0209.01

$$a \operatorname{csc}^{-1}(x) + b \log(y) = \log \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} y^b \right) - \left[\frac{-\arg \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} \right) - \arg(y^b) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re} \left(a \log \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right) + \pi \right)}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}(b \log(y))}{2\pi} \right]$$

01.27.16.0210.01

$$a \operatorname{csc}^{-1}(x) + b \log(y) = i\pi \left[1 - (-1)^{\left\lfloor \frac{\arg \left(y^b \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} + 1 \right)}{2\pi} \right\rfloor - \left\lfloor \frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} y^b \right)}{2\pi} \right\rfloor} \right] + i(-1)^{\left\lfloor \frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} y^{b-1} \right)}{2\pi} + \frac{1}{2} - \frac{\arg \left(y^b \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} + 1 \right)}{2\pi} \right\rfloor - \left\lfloor \frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} y^b \right)}{\pi} \right\rfloor} \right] \left[\operatorname{csc}^{-1} \left(\frac{2 \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} y^b}{y^{2b} \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-2ia} + 1} \right) - \frac{\pi}{2} \right] - \left[\frac{-\arg \left(\left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right)^{-ia} \right) - \arg(y^b) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re} \left(a \log \left(\sqrt{1 - \frac{1}{x^2} + \frac{i}{x}} \right) + \pi \right)}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}(b \log(y))}{2\pi} \right]$$

Involving $\sin^{-1}(z)$

01.27.16.0211.01

$$a \tanh^{-1}(x) + b \sin^{-1}(y) = a i\pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \left[\frac{-\arg \left(\left(\frac{1-x}{x+1} \right)^{-\frac{a}{2}} \right) - \arg \left(i y + \sqrt{1-y^2} \right)^{-ib} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im} \left(a \log \left(\frac{1-x}{x+1} \right) + \pi \right)}{2\pi} \right] + \left[\frac{\operatorname{Re} \left(b \log \left(i y + \sqrt{1-y^2} \right) + \pi \right)}{2\pi} \right] + \log \left(\left(\frac{1-x}{x+1} \right)^{-\frac{a}{2}} \left(i y + \sqrt{1-y^2} \right)^{-ib} \right)$$

01.27.16.0212.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \sin^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{-ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(b \log\left(iy + \sqrt{1-y^2}\right)\right) + \pi}{2\pi} \right] \right) + \\
 & i \pi \left(\left[\frac{\arg\left(\left(iy + \sqrt{1-y^2}\right)^{-ib}\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}\right)}{2\pi} + \frac{1}{2} \right] \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(iy + \sqrt{1-y^2}\right)^{-ib} - 1}{\left(iy + \sqrt{1-y^2}\right)^{-ib} \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}} \right)
 \end{aligned}$$

Involving $\cos^{-1}(z)$

01.27.16.0213.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \cos^{-1}(y) &= \frac{\pi b}{2} + a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(b \log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) + \\
 & \log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(iy + \sqrt{1-y^2}\right)^{ib}\right)
 \end{aligned}$$

01.27.16.0214.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \cos^{-1}(y) &= \frac{\pi b}{2} + a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(iy + \sqrt{1-y^2}\right)^{ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(b \log\left(iy + \sqrt{1-y^2}\right)\right)}{2\pi} \right] \right) + \\
 & i \pi \left(\left[\frac{\arg\left(\left(iy + \sqrt{1-y^2}\right)^{ib}\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}\right)}{2\pi} + \frac{1}{2} \right] \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(iy + \sqrt{1-y^2}\right)^{ib} - 1}{\left(iy + \sqrt{1-y^2}\right)^{ib} \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}} \right)
 \end{aligned}$$

Involving $\tan^{-1}(z)$

01.27.16.0215.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \tan^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi \\
 &\left(\left[\frac{-\arg\left((iy+1)^{-\frac{1}{2}(ib)}\right) - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(b \log(iy+1)) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}\right)\right)}{2\pi} \right] \right) - \\
 &2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((1-iy)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(b \log(1-iy))}{2\pi} \right] \right) + \\
 &\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}(iy+1)^{-\frac{1}{2}(ib)}\right)
 \end{aligned}$$

01.27.16.0216.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \tan^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi \\
 &\left(\left[\frac{-\arg\left((iy+1)^{-\frac{1}{2}(ib)}\right) - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(b \log(iy+1)) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}\right)\right)}{2\pi} \right] \right) - \\
 &2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((1-iy)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(b \log(1-iy))}{2\pi} \right] \right) + \\
 &i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\frac{1-x}{x+1}\right)^{\frac{a}{2}}(iy+1)^{-\frac{1}{2}(ib)}(1-iy)^{\frac{ib}{2}} + 1\right)}{2\pi} \right\rfloor + \frac{1}{2}} \right) + 2 \tanh^{-1}\left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(1-iy)^{\frac{ib}{2}}(iy+1)^{-\frac{1}{2}(ib)} - 1}{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}(iy+1)^{-\frac{1}{2}(ib)}(1-iy)^{\frac{ib}{2}} + 1}\right)
 \end{aligned}$$

Involving $\cot^{-1}(z)$

01.27.16.0217.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \cot^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 &2 i \pi \left(\left[\frac{-\arg\left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)} - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(b \log(1 + \frac{i}{y})) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}}\right)\right)}{2\pi} \right] \right) - \\
 &2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}(a \log\left(\frac{1-x}{x+1}\right)) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(b \log(1 - \frac{i}{y}))}{2\pi} \right] \right) + \\
 &\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} \left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)}\right)
 \end{aligned}$$

01.27.16.0218.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \cot^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 &2 i \pi \left(\left[\frac{-\arg\left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)} - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Re}(b \log(1 + \frac{i}{y})) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}}\right)\right)}{2\pi} \right] \right) - \\
 &2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}(a \log\left(\frac{1-x}{x+1}\right)) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Re}(b \log(1 - \frac{i}{y}))}{2\pi} \right] \right) + \\
 &i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} + 1\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} \left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)} - 1}{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 + \frac{i}{y}\right)^{-\frac{1}{2}(ib)} \left(1 - \frac{i}{y}\right)^{\frac{ib}{2}} + 1} \right)
 \end{aligned}$$

Involving $\csc^{-1}(z)$

01.27.16.0219.01

$$a \tanh^{-1}(x) + b \csc^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) +$$

$$\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib}\right)$$

01.27.16.0220.01

$$a \tanh^{-1}(x) + b \csc^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\pi} \right] \right) +$$

$$i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib}\right) \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right\rfloor + \frac{1}{2}} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib} - 1}{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-ib} \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} + 1} \right)$$

Involving $\sec^{-1}(z)$

01.27.16.0221.01

$$a \tanh^{-1}(x) + b \sec^{-1}(y) = -\frac{\pi b}{2} + \frac{\pi b}{2} + a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right)}{2\pi} \right] \right) +$$

$$\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib}\right)$$

01.27.16.0222.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \sec^{-1}(y) &= -\frac{\pi b}{2} + \frac{\pi b}{2} + a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib}\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right)}{2\pi} \right] \right) + \\
 & i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib} \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib} - 1}{\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{ib} \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}} \right)
 \end{aligned}$$

Involving $\sinh^{-1}(z)$

01.27.16.0223.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \sinh^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(y + \sqrt{y^2+1}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log\left(y + \sqrt{y^2+1}\right)\right)}{2\pi} \right] \right) + \\
 & \log\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(y + \sqrt{y^2+1}\right)^b
 \end{aligned}$$

01.27.16.0224.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \sinh^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(y + \sqrt{y^2+1}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log\left(y + \sqrt{y^2+1}\right)\right)}{2\pi} \right] \right) + \\
 & i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(y + \sqrt{y^2+1}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(y + \sqrt{y^2+1}\right)^b - 1}{\left(y + \sqrt{y^2+1}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}} \right)
 \end{aligned}$$

Involving $\cosh^{-1}(z)$

01.27.16.0225.01

$$a \tanh^{-1}(x) + b \cosh^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi$$

$$\left(\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((y + \sqrt{y-1} \sqrt{y+1})^b\right) + \pi}{2\pi} + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log(y + \sqrt{y-1} \sqrt{y+1})\right)}{2\pi} \right] \right) +$$

$$\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (y + \sqrt{y-1} \sqrt{y+1})^b\right)$$

01.27.16.0226.01

$$a \tanh^{-1}(x) + b \cosh^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi$$

$$\left(\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left((y + \sqrt{y-1} \sqrt{y+1})^b\right) + \pi}{2\pi} + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log(y + \sqrt{y-1} \sqrt{y+1})\right)}{2\pi} \right] \right) +$$

$$i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left((y + \sqrt{y-1} \sqrt{y+1})^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2} + 1}\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1}\left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} (y + \sqrt{y-1} \sqrt{y+1})^b - 1}{(y + \sqrt{y-1} \sqrt{y+1})^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2} + 1}}\right)$$

Involving $\coth^{-1}(z)$

01.27.16.0227.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \coth^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(b \log\left(1 - \frac{1}{y}\right)\right) + \pi}{2\pi} \right] \right) - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(1 + \frac{1}{y}\right)^{b/2} - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Im}\left(b \log\left(1 + \frac{1}{y}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi} \right] \right) + \\
 & \log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} \left(1 + \frac{1}{y}\right)^{b/2}\right)
 \end{aligned}$$

01.27.16.0228.01

$$\begin{aligned}
 a \tanh^{-1}(x) + b \coth^{-1}(y) &= a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(b \log\left(1 - \frac{1}{y}\right)\right) + \pi}{2\pi} \right] \right) - \\
 & 2 i \pi \left(\left[\frac{-\arg\left(1 + \frac{1}{y}\right)^{b/2} - \arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \frac{1}{2} \operatorname{Im}\left(b \log\left(1 + \frac{1}{y}\right)\right)}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi} \right] \right) + \\
 & i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} \left(1 + \frac{1}{y}\right)^{b/2} + 1\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1}\left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} \left(1 + \frac{1}{y}\right)^{b/2} - 1}{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(1 - \frac{1}{y}\right)^{-\frac{b}{2}} \left(1 + \frac{1}{y}\right)^{b/2} + 1}\right)
 \end{aligned}$$

Involving csch⁻¹(z)

01.27.16.0229.01

$$a \tanh^{-1}(x) + b \operatorname{csch}^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)\right)}{2\pi} \right] \right) +$$

$$\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b\right)$$

01.27.16.0230.01

$$a \tanh^{-1}(x) + b \operatorname{csch}^{-1}(y) = a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] -$$

$$2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)\right)}{2\pi} \right] \right) +$$

$$i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2} + 1}\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b - 1}{\left(\sqrt{1 + \frac{1}{y^2}} + \frac{1}{y}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2} + 1}} \right)$$

Involving $\operatorname{sech}^{-1}(z)$

01.27.16.0231.01

$$a \tanh^{-1}(x) + b \operatorname{sech}^{-1}(y) =$$

$$a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi \left(\left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{\frac{1}{y} - 1} \sqrt{1 + \frac{1}{y}} + \frac{1}{y}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] + \left[\frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{\frac{1}{y} - 1} \sqrt{1 + \frac{1}{y}} + \frac{1}{y}\right)\right)}{2\pi} \right] \right) +$$

$$\log\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{\frac{1}{y} - 1} \sqrt{1 + \frac{1}{y}} + \frac{1}{y}\right)^b\right)$$

01.27.16.0232.01

$$a \tanh^{-1}(x) + b \operatorname{sech}^{-1}(y) =$$

$$a i \pi \left[\frac{\arg(x+1) - \arg(1-x) + \pi}{2\pi} \right] - 2 i \pi \left[\frac{-\arg\left(\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}}\right) - \arg\left(\left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}+\frac{1}{y}}\right)^b\right) + \pi}{2\pi} \right] + \left[\frac{\frac{1}{2} \operatorname{Im}\left(a \log\left(\frac{1-x}{x+1}\right)\right) + \pi}{2\pi} \right] +$$

$$\left[\frac{\pi - \operatorname{Im}\left(b \log\left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}+\frac{1}{y}}\right)\right)}{2\pi} \right] +$$

$$i \pi \left(1 - (-1)^{\left\lfloor \frac{\arg\left(\left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}+\frac{1}{y}}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}\right)}{2\pi} + \frac{1}{2} \right\rfloor} \right) + 2 \tanh^{-1} \left(\frac{\left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}} \left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}+\frac{1}{y}}\right)^b - 1}{\left(\sqrt{\frac{1}{y}-1} \sqrt{1+\frac{1}{y}+\frac{1}{y}}\right)^b \left(\frac{1-x}{x+1}\right)^{-\frac{a}{2}+1}} \right)$$

Identities

Functional identities

01.27.17.0001.01

$$\tanh(w(z_1) + w(z_2)) = \frac{z_1 + z_2}{1 + z_1 z_2} ; w(z) = \tanh^{-1}(z)$$

Complex characteristics

Real part

01.27.19.0001.01

$$\operatorname{Re}(\tanh^{-1}(x + i y)) = \frac{1}{4} \log\left(\frac{(x+1)^2 + y^2}{(1-x)^2 + y^2}\right)$$

01.27.19.0002.01

$$\operatorname{Re}(\tanh^{-1}(x + i y)) = \frac{1}{4} (\log((x+1)^2 + y^2) - \log(x^2 - 2x + y^2 + 1))$$

Imaginary part

01.27.19.0003.01

$$\operatorname{Im}(\tanh^{-1}(x + i y)) = \frac{1}{2} \left(\tan^{-1}\left(\frac{2y}{1-x^2-y^2}\right) + \frac{\pi}{2} (\operatorname{sgn}(x^2 + y^2 - 1) + 1) \operatorname{sgn}(y) \right)$$

01.27.19.0004.01

$$\operatorname{Im}(\tanh^{-1}(x + i y)) = \frac{1}{2} (\tan^{-1}(x + 1, y) - \tan^{-1}(1 - x, -y))$$

Absolute value

01.27.19.0005.01

$$|\tanh^{-1}(x + i y)| = \frac{1}{2} \sqrt{\left((\tan^{-1}(1 - x, -y) - \tan^{-1}(x + 1, y))^2 + \frac{1}{4} (\log(x^2 - 2 x + y^2 + 1) - \log((x + 1)^2 + y^2))^2 \right)}$$

Argument

01.27.19.0006.01

$$\arg(\tanh^{-1}(x + i y)) = \tan^{-1}(\log((x + 1)^2 + y^2) - \log(x^2 - 2 x + y^2 + 1), 2 \tan^{-1}(x + 1, y) - 2 \tan^{-1}(1 - x, -y))$$

Conjugate value

01.27.19.0007.01

$$\overline{\tanh^{-1}(x + i y)} = \frac{1}{4} (2 i \tan^{-1}(1 - x, -y) - 2 i \tan^{-1}(x + 1, y) - \log(x^2 - 2 x + y^2 + 1) + \log((x + 1)^2 + y^2))$$

Signum value

01.27.19.0008.01

$$\operatorname{sgn}(\tanh^{-1}(x + i y)) = \frac{-i \tan^{-1}(1 - x, -y) + i \tan^{-1}(x + 1, y) - \frac{1}{2} \log(x^2 - 2 x + y^2 + 1) + \frac{1}{2} \log((x + 1)^2 + y^2)}{\sqrt{(\tan^{-1}(1 - x, -y) - \tan^{-1}(x + 1, y))^2 + \frac{1}{4} (\log(x^2 - 2 x + y^2 + 1) - \log((x + 1)^2 + y^2))^2}}$$

Differentiation

Low-order differentiation

01.27.20.0001.01

$$\frac{\partial \tanh^{-1}(z)}{\partial z} = \frac{1}{1 - z^2}$$

01.27.20.0002.01

$$\frac{\partial^2 \tanh^{-1}(z)}{\partial z^2} = \frac{2 z}{(1 - z^2)^2}$$

Symbolic differentiation

01.27.20.0005.01

$$\frac{\partial^n \tanh^{-1}(z)}{\partial z^n} = \tanh^{-1}(z) \delta_n + \sum_{k=0}^{n-1} \frac{k! (2 k - n + 2)_{2(n-k)-2} (1 - z^2)^{-k-1}}{(n - k - 1)! (2 z)^{n-2k-1}} ; n \in \mathbb{N}$$

01.27.20.0006.01

$$\frac{\partial^n \tanh^{-1}(z)}{\partial z^n} = \frac{(n - 1)!}{2} ((1 - z)^{-n} + (-1)^{n-1} (z + 1)^{-n}) ; n \in \mathbb{N}^+$$

01.27.20.0007.01

$$\frac{\partial^n \tanh^{-1}(z)}{\partial z^n} = \frac{(n-1)!}{2(1-z^2)^n} \sum_{k=0}^n \binom{n}{k} (1+(-1)^{k+n-1}) z^k; n \in \mathbb{N}^+$$

01.27.20.0003.02

$$\frac{\partial^n \tanh^{-1}(z)}{\partial z^n} = 2^{n-1} \sqrt{\pi} z^{1-n} {}_3\tilde{F}_2\left(\frac{1}{2}, 1, 1; 1 - \frac{n}{2}, \frac{3-n}{2}; z^2\right); n \in \mathbb{N}$$

01.27.20.0008.01

$$\frac{\partial^{2n+1} \tanh^{-1}(z)}{\partial z^{2n+1}} = (2n)! (1-z^2)^{-n-\frac{1}{2}} T_{2n+1}\left(\frac{1}{\sqrt{1-z^2}}\right); n \in \mathbb{N}$$

Brychkov Yu.A. (2006)

01.27.20.0009.01

$$\frac{\partial^{2n} \tanh^{-1}(z)}{\partial z^{2n}} = (2n-1)! z (1-z^2)^{-n-\frac{1}{2}} U_{2n-1}\left(\frac{1}{\sqrt{1-z^2}}\right); n \in \mathbb{N}^+$$

Brychkov Yu.A. (2006)

Fractional integro-differentiation

01.27.20.0004.01

$$\frac{\partial^\alpha \tanh^{-1}(z)}{\partial z^\alpha} = 2^{\alpha-1} \sqrt{\pi} z^{1-\alpha} {}_3\tilde{F}_2\left(\frac{1}{2}, 1, 1; 1 - \frac{\alpha}{2}, \frac{3-\alpha}{2}; z^2\right)$$

Integration

Indefinite integration

For the direct function itself

01.27.21.0001.01

$$\int \tanh^{-1}(z) dz = z \tanh^{-1}(z) + \frac{1}{2} \log(1-z^2)$$

01.27.21.0002.01

$$\int \frac{\tanh^{-1}(z)}{z} dz = \frac{1}{2} (\text{Li}_2(z) - \text{Li}_2(-z))$$

01.27.21.0003.01

$$\int \frac{\tanh^{-1}(z)}{\sqrt{z}} dz = 2 \tan^{-1}(\sqrt{z}) + 2 \sqrt{z} \tanh^{-1}(z) + \log(\sqrt{z}-1) - \log(\sqrt{z}+1)$$

01.27.21.0004.01

$$\int z^n \tanh^{-1}(z) dz = -\frac{z^{n+1}}{2(n+1)} \left(z \Phi\left(z^2, 1, \frac{n}{2} + 1\right) - 2 \tanh^{-1}(z) \right)$$

01.27.21.0005.01

$$\int z^{\alpha-1} \tanh^{-1}(z) dz = \frac{z^{\alpha} \tanh^{-1}(z)}{\alpha} - \frac{z^{\alpha+1}}{\alpha(\alpha+1)} {}_2F_1\left(\frac{\alpha+1}{2}, 1; \frac{\alpha+3}{2}; z^2\right)$$

01.27.21.0006.01

$$\int \tanh^{-1}(b+az) dz = \frac{(b+az) \tanh^{-1}(b+az)}{a} + \frac{\log((b+az)^2 - 1)}{2a}$$

01.27.21.0007.01

$$\int z \tanh^{-1}(b+az) dz = \frac{1}{4} \left(\frac{\log(b+az-1)(b-1)^2}{a^2} + \frac{2z}{a} + 2z^2 \tanh^{-1}(b+az) - \frac{(b+1)^2 \log(b+az+1)}{a^2} \right)$$

01.27.21.0008.01

$$\int \frac{\tanh^{-1}(az+b)}{z} dz = -\frac{1}{2} i \left(i (\tanh^{-1}(b) - \tanh^{-1}(b+az))^2 - 2i \log(1 - e^{2 \tanh^{-1}(b) - 2 \tanh^{-1}(b+az)}) (\tanh^{-1}(b) - \tanh^{-1}(b+az)) + \right. \\ \left. 2i \log(-2i \sinh(\tanh^{-1}(b) - \tanh^{-1}(b+az))) (\tanh^{-1}(b) - \tanh^{-1}(b+az)) - \frac{1}{4} i (\pi - 2i \tanh^{-1}(b+az))^2 + \right. \\ \left. (\pi - 2i \tanh^{-1}(b+az)) \log(1 + e^{2 \tanh^{-1}(b+az)}) - (\pi - 2i \tanh^{-1}(b+az)) \log\left(\frac{2}{\sqrt{1 - (b+az)^2}}\right) + \right. \\ \left. 2i \tanh^{-1}(b+az) \left(\log(-i \sinh(\tanh^{-1}(b) - \tanh^{-1}(b+az))) - \log\left(\frac{1}{\sqrt{1 - (b+az)^2}}\right) \right) - \right. \\ \left. i \operatorname{Li}_2(-e^{2 \tanh^{-1}(b+az)}) - i \operatorname{Li}_2(e^{2 \tanh^{-1}(b) - 2 \tanh^{-1}(b+az)}) \right)$$

01.27.21.0009.01

$$\int \tanh^{-1}(az^2 + bz + c) dz = \\ \frac{1}{4a} \left(-2\sqrt{4a(c-1) - b^2} \tan^{-1}\left(\frac{b+2az}{\sqrt{4a(c-1) - b^2}}\right) + 2\sqrt{4a(c+1) - b^2} \tan^{-1}\left(\frac{b+2az}{\sqrt{4a(c+1) - b^2}}\right) + \right. \\ \left. 4az \tanh^{-1}(c+z(b+az)) - b \log(az^2 + bz + c - 1) + b \log(az^2 + bz + c + 1) \right)$$

Involving the direct function

01.27.21.0010.01

$$\int e^{az} \tanh^{-1}(bz) dz = \frac{1}{2a} \left(2e^{az} \tanh^{-1}(bz) + e^{a/b} \operatorname{Ei}\left(a\left(z - \frac{1}{b}\right)\right) - e^{-a/b} \operatorname{Ei}\left(a\left(z + \frac{1}{b}\right)\right) \right)$$

Definite integration

For the direct function itself

01.27.21.0011.01

$$\int_0^1 \tanh^{-1}(t) dt = \log(2)$$

01.27.21.0012.01

$$\int_0^1 \frac{\tanh^{-1}(t)}{t} dt = \frac{\pi^2}{8}$$

Involving the direct function

01.27.21.0013.01

$$\int_0^1 \log(t) \tanh^{-1}(t) dt = \frac{\pi^2}{24} - \log(2)$$

Integral transforms**Inverse Laplace transforms**

01.27.22.0001.01

$$\mathcal{L}_t^{-1}[\tanh^{-1}(t)](z) = \frac{\sinh(z)}{z}$$

Representations through more general functions**Through hypergeometric functions****Involving ${}_2F_1$**

01.27.26.0001.01

$$\tanh^{-1}(z) = z {}_2F_1\left(1, \frac{1}{2}; \frac{3}{2}; z^2\right)$$

01.27.26.0002.01

$$\tanh^{-1}(z) = \frac{\log(2)}{2} - \frac{1}{2} \log(1-z) + \frac{1}{4} (z-1) {}_2F_1\left(1, 1; 2; \frac{1-z}{2}\right)$$

01.27.26.0003.01

$$\tanh^{-1}(z) = -\frac{\log(2)}{2} + \frac{1}{2} \log(z+1) + \frac{1}{4} (z+1) {}_2F_1\left(1, 1; 2; \frac{z+1}{2}\right)$$

01.27.26.0004.01

$$\tanh^{-1}(z) = \frac{\pi z}{2\sqrt{-z^2}} + \frac{1}{z} {}_2F_1\left(\frac{1}{2}, 1; \frac{3}{2}; \frac{1}{z^2}\right); z \notin (-1, 1)$$

Through Meijer G**Classical cases for the direct function itself**

01.27.26.0005.01

$$\tanh^{-1}(z) = -\frac{1}{2z} G_{2,2}^{1,2}\left(-z^2 \left| \begin{matrix} 1, \frac{3}{2} \\ 1, \frac{1}{2} \end{matrix} \right.\right)$$

01.27.26.0006.01

$$\tanh^{-1}(z) = -\frac{\sqrt{-z^2}}{2z} G_{2,2}^{1,2} \left(-z^2 \left| \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{2}, 0 \end{matrix} \right. \right)$$

01.27.26.0007.01

$$\tanh^{-1}(z) = \frac{i}{2} G_{2,2}^{1,2} \left(-z^2 \left| \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{2}, 0 \end{matrix} \right. \right) /; 0 < \arg(z) \leq \pi$$

01.27.26.0016.01

$$\tanh^{-1}(z) - \sum_{k=0}^n \frac{z^{2k+1}}{2k+1} = \frac{(-1)^n \sqrt{-z^2}}{2z} G_{3,3}^{1,3} \left(-z^2 \left| \begin{matrix} 1, n + \frac{3}{2}, \frac{1}{2} \\ n + \frac{3}{2}, 0, \frac{1}{2} \end{matrix} \right. \right) /; n \in \mathbb{N}$$

01.27.26.0017.01

$$\begin{aligned} \tanh^{-1}(z) - & \frac{1}{4} \pi \left(\sqrt{-\frac{1}{z^2}} z + i \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{1-\frac{1}{z}} \sqrt{\frac{z}{z-1}} + \frac{i \sqrt{-z^2}}{z} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) \right) - \\ & \sum_{k=0}^n \frac{z^{-2k-1}}{2k+1} = \frac{(-1)^n z}{2} \sqrt{-\frac{1}{z^2}} G_{3,3}^{1,3} \left(-\frac{1}{z^2} \left| \begin{matrix} 1, n + \frac{3}{2}, \frac{1}{2} \\ n + \frac{3}{2}, 0, \frac{1}{2} \end{matrix} \right. \right) /; n \in \mathbb{N} \end{aligned}$$

01.27.26.0008.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sqrt{-z^2} G_{2,2}^{1,2} \left(-z \left| \begin{matrix} -\frac{1}{2}, 0 \\ -\frac{1}{2}, -1 \end{matrix} \right. \right)$$

01.27.26.0018.01

$$\tanh^{-1}(\sqrt{z}) - \sum_{k=0}^n \frac{z^{k+\frac{1}{2}}}{2k+1} = \frac{(-1)^n \sqrt{-z}}{2\sqrt{z}} G_{3,3}^{1,3} \left(-z \left| \begin{matrix} 1, n + \frac{3}{2}, \frac{1}{2} \\ n + \frac{3}{2}, 0, \frac{1}{2} \end{matrix} \right. \right) /; n \in \mathbb{N}$$

01.27.26.0019.01

$$\tanh^{-1}(\sqrt{z}) + \frac{\pi \sqrt{-z}}{2\sqrt{z}} - \sum_{k=0}^n \frac{z^{-k-\frac{1}{2}}}{2k+1} = \frac{(-1)^n \sqrt{z}}{2} \sqrt{-\frac{1}{z}} G_{3,3}^{1,3} \left(-\frac{1}{z} \left| \begin{matrix} 1, n + \frac{3}{2}, \frac{1}{2} \\ n + \frac{3}{2}, 0, \frac{1}{2} \end{matrix} \right. \right) /; n \in \mathbb{N} \wedge z \notin (0, 1)$$

Generalized cases for the direct function itself

01.27.26.0009.01

$$\tanh^{-1}(z) = -\frac{i}{2} G_{2,2}^{1,2} \left(iz, \frac{1}{2} \left| \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{2}, 0 \end{matrix} \right. \right)$$

01.27.26.0020.01

$$\tanh^{-1}(z) - \sum_{k=0}^n \frac{z^{2k+1}}{2k+1} = \frac{(-1)^n i}{2} G_{3,3}^{1,3} \left(iz, \frac{1}{2} \left| \begin{matrix} 1, n + \frac{3}{2}, \frac{1}{2} \\ n + \frac{3}{2}, 0, \frac{1}{2} \end{matrix} \right. \right) /; n \in \mathbb{N}$$

01.27.26.0021.01

$$\tanh^{-1}(z) + \frac{\pi i}{4} \left(-\sqrt{1-z} \sqrt{\frac{1}{1-z}} + i \sqrt{-\frac{1}{z^2}} z + \sqrt{1-\frac{1}{z}} \sqrt{\frac{z}{z-1}} - \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} - \frac{i\sqrt{-z^2}}{z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) - \sum_{k=0}^n \frac{z^{-2k-1}}{2k+1} = \frac{(-1)^{n-1} i}{2} G_{3,3}^{1,3} \left(-\frac{i}{z}, \frac{1}{2} \middle| 1, n + \frac{3}{2}, \frac{1}{2} \right); n \in \mathbb{N}$$

01.27.26.0022.01

$$\tanh^{-1}(z) - \frac{\pi z}{2\sqrt{-z^2}} - \sum_{k=0}^n \frac{z^{-2k-1}}{2k+1} = \frac{(-1)^{n-1} i}{2} G_{3,3}^{1,3} \left(-\frac{i}{z}, \frac{1}{2} \middle| 1, n + \frac{3}{2}, \frac{1}{2} \right); n \in \mathbb{N} \wedge z \notin (-1, 1)$$

Through other functions

Involving inverse Jacobi functions

01.27.26.0010.01

$$\tanh^{-1}(z) = i \operatorname{cs}^{-1} \left(\frac{i}{z} \middle| 0 \right)$$

01.27.26.0011.01

$$\tanh^{-1}(z) = \operatorname{ns}^{-1} \left(\frac{1}{z} \middle| 1 \right)$$

01.27.26.0012.01

$$\tanh^{-1}(z) = -i \operatorname{sc}^{-1}(iz | 0)$$

01.27.26.0013.01

$$\tanh^{-1}(z) = \operatorname{sn}^{-1}(z | 1)$$

Involving some elliptic-type functions

01.27.26.0014.01

$$\tanh^{-1}(z) = \sqrt{z-1} \operatorname{Pi} \left(z; \tan^{-1} \left(\frac{z}{\sqrt{z-1}} \right) \middle| 0 \right)$$

Involving some hypergeometric-type functions

01.27.26.0015.01

$$\tanh^{-1}(z) = \frac{\sqrt{z^2}}{2z} B_{z^2} \left(\frac{1}{2}, 0 \right)$$

Representations through equivalent functions

With inverse function

Involving $\tanh^{-1}(\tanh(z))$

01.27.27.0001.01

$$\tanh^{-1}(\tanh(z)) = z; -\frac{\pi}{2} < \operatorname{Im}(z) < \frac{\pi}{2} \vee \left(\operatorname{Im}(z) = -\frac{\pi}{2} \wedge \operatorname{Re}(z) > 0 \right) \vee \left(\operatorname{Im}(z) = \frac{\pi}{2} \wedge \operatorname{Re}(z) < 0 \right)$$

01.27.27.0002.01

$$\tanh^{-1}(\tanh(z)) = z + \pi i /; -\frac{3\pi}{2} < \text{Im}(z) < -\frac{\pi}{2} \vee \left(\text{Im}(z) = -\frac{3\pi}{2} \wedge \text{Re}(z) > 0 \right) \vee \left(\text{Im}(z) = -\frac{\pi}{2} \wedge \text{Re}(z) < 0 \right)$$

01.27.27.0003.01

$$\tanh^{-1}(\tanh(z)) = z - \pi i /; \frac{\pi}{2} < \text{Im}(z) < \frac{3\pi}{2} \vee \left(\text{Im}(z) = \frac{\pi}{2} \wedge \text{Re}(z) > 0 \right) \vee \left(\text{Im}(z) = \frac{3\pi}{2} \wedge \text{Re}(z) < 0 \right)$$

01.27.27.0004.01

$$\begin{aligned} \tanh^{-1}(\tanh(z)) &= z - \pi i k /; \\ &\left(k\pi - \frac{\pi}{2} < \text{Im}(z) < \pi k + \frac{\pi}{2} \vee \left(\text{Im}(z) = k\pi - \frac{\pi}{2} \wedge \text{Re}(z) > 0 \right) \vee \left(\text{Im}(z) = \pi k + \frac{\pi}{2} \wedge \text{Re}(z) < 0 \right) \right) \wedge k \in \mathbb{Z} \end{aligned}$$

01.27.27.0005.01

$$\tanh^{-1}(\tanh(z)) = z + i\pi \left[\frac{1}{2} - \frac{\text{Im}(z)}{\pi} \right] + \frac{1}{2} \left(1 + (-1)^{\lfloor \frac{\text{Im}(z)+\frac{1}{2}}{\pi} \rfloor + \lfloor -\frac{\text{Im}(z)-\frac{1}{2}}{\pi} \rfloor} \right) \pi \theta(\text{Re}(z)) /; \frac{iz}{\pi} - \frac{1}{2} \notin \mathbb{Z}$$

01.27.27.3483.01

$$\tanh^{-1}(\tanh(z)) = \begin{cases} i & \frac{\pi-2iz}{2\pi} \in \mathbb{Z} \\ z - \pi i \left[\frac{2\text{Im}(z)-\pi}{2\pi} \right] & \frac{2\text{Im}(z)+\pi}{2\pi} \in \mathbb{Z} \wedge \text{Re}(z) < 0 \\ z - \pi i \left[\frac{2\text{Im}(z)+\pi}{2\pi} \right] & \text{True} \end{cases}$$

01.27.27.3484.01

$$\tanh^{-1}(\tanh(z)) = \coth^{-1}(\coth(z)) /; \frac{\pi-2iz}{2\pi} \notin \mathbb{Z}$$

Involving $\tanh(n \tanh^{-1}(z))$

01.27.27.0006.01

$$\tanh(\tanh^{-1}(z)) = z$$

01.27.27.0007.01

$$\tanh(n \tanh^{-1}(z)) = \frac{(z+1)^n - (1-z)^n}{(1-z)^n + (z+1)^n} /; n \in \mathbb{N}^+$$

Involving $\tanh^{-1}(\coth(z))$

01.27.27.3485.01

$$\tanh^{-1}(\coth(z)) = z - \frac{i\pi}{2} /; 0 < \text{Im}(z) < \pi \vee (\text{Im}(z) = 0 \wedge \text{Re}(z) > 0) \vee (\text{Im}(z) = \pi \wedge \text{Re}(z) < 0)$$

01.27.27.3486.01

$$\tanh^{-1}(\coth(z)) = z + \frac{i\pi}{2} /; -\pi < \text{Im}(z) < 0 \vee (\text{Im}(z) = -\pi \wedge \text{Re}(z) > 0) \vee (\text{Im}(z) = 0 \wedge \text{Re}(z) < 0)$$

01.27.27.3487.01

$$\begin{aligned} \tanh^{-1}(\coth(z)) &= z - \frac{i\pi}{2} - i k \pi /; \\ &(k\pi < \text{Im}(z) < (k+1)\pi \vee (\text{Im}(z) = k\pi \wedge \text{Re}(z) > 0) \vee (\text{Im}(z) = (k+1)\pi \wedge \text{Re}(z) < 0)) \wedge k \in \mathbb{Z} \end{aligned}$$

01.27.27.3488.01

$$\tanh^{-1}(\coth(z)) = z + \frac{i\pi}{2} + i\pi \left[-\frac{\text{Im}(z)}{\pi} \right] - \frac{1}{2} (\pi i) \left(1 + (-1)^{\lfloor \frac{\text{Im}(z)}{\pi} \rfloor + \lfloor -\frac{\text{Im}(z)}{\pi} \rfloor} \right) \theta(\text{Re}(z)) /; \frac{iz}{\pi} \notin \mathbb{Z}$$

01.27.27.3489.01

$$\tanh^{-1}(\coth(z)) = \begin{cases} i & \frac{iz}{\pi} \in \mathbb{Z} \\ z - \pi i \left\lfloor \frac{\operatorname{Im}(z)}{\pi} \right\rfloor + \frac{i\pi}{2} & \frac{\operatorname{Im}(z)}{\pi} \in \mathbb{Z} \wedge \operatorname{Re}(z) < 0 \\ z - \pi i \left\lfloor \frac{\operatorname{Im}(z)}{\pi} \right\rfloor - \frac{i\pi}{2} & \text{True} \end{cases}$$

01.27.27.3490.01

$$\tanh^{-1}(\coth(z)) = \coth^{-1}(\tanh(z)) /; \frac{iz}{\pi} \notin \mathbb{Z}$$

With related functions

Involving log

01.27.27.0008.01

$$\tanh^{-1}(z) = \frac{1}{2} (\log(1+z) - \log(1-z))$$

01.27.27.0009.01

$$\tanh^{-1}(z) = \frac{1}{2} \log\left(\frac{1+z}{1-z}\right) /; z \notin (1, \infty)$$

01.27.27.0010.01

$$\tanh^{-1}(z) = \log\left(\sqrt{\frac{1+z}{1-z}}\right) /; z \notin (1, \infty)$$

01.27.27.0011.01

$$\tanh^{-1}(z) = \log\left((z+1) \sqrt{\frac{1}{1-z^2}}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.0012.01

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

Involving \sin^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{1+z^2}{1-z^2}\right)$

01.27.27.0043.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{i}{2} \sin^{-1}\left(\frac{1+z^2}{1-z^2}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0044.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{i}{2} \sin^{-1}\left(\frac{z^2+1}{1-z^2}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0045.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2}i \sin^{-1}\left(\frac{z^2+1}{1-z^2}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0046.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2}i \sin^{-1}\left(\frac{z^2+1}{1-z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0047.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{z^2+1}{z^2-1}\right)$

01.27.27.0048.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{i}{2} \sin^{-1}\left(\frac{z^2+1}{z^2-1}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0049.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{i}{2} \sin^{-1}\left(\frac{z^2+1}{z^2-1}\right); \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0050.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2}i \sin^{-1}\left(\frac{z^2+1}{z^2-1}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0051.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2}i \sin^{-1}\left(\frac{z^2+1}{z^2-1}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0052.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

01.27.27.0053.01

$$\tanh^{-1}(z) = i \sin^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.0054.01

$$\tanh^{-1}(z) = -i \sin^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0055.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

01.27.27.0056.01

$$\tanh^{-1}(z) = i \sin^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0057.01

$$\tanh^{-1}(z) = -i \sin^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0058.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

01.27.27.0059.01

$$\tanh^{-1}(z) = i \sin^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0060.01

$$\tanh^{-1}(z) = -i \sin^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0061.01

$$\tanh^{-1}(z) = -\pi i + i \sin^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0062.01

$$\tanh^{-1}(z) = \pi i + i \sin^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0063.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

01.27.27.0064.01

$$\tanh^{-1}(z) = i \sin^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0065.01

$$\tanh^{-1}(z) = -i \sin^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0066.01

$$\tanh^{-1}(z) = -\pi i + i \sin^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0067.01

$$\tanh^{-1}(z) = \pi i - i \sin^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0068.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

01.27.27.0069.01

$$\tanh^{-1}(z) = i \sin^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0070.01

$$\tanh^{-1}(z) = -i \sin^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0071.01

$$\tanh^{-1}(z) = -\pi i + i \sin^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0072.01

$$\tanh^{-1}(z) = \pi i - i \sin^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0073.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\frac{z^2}{z^2-1}} \right)$

01.27.27.0074.01

$$\tanh^{-1}(z) = i \sin^{-1} \left(\sqrt{\frac{z^2}{z^2-1}} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0075.01

$$\tanh^{-1}(z) = -i \sin^{-1} \left(\sqrt{\frac{z^2}{z^2-1}} \right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0076.01

$$\tanh^{-1}(z) = -\pi i + i \sin^{-1} \left(\sqrt{\frac{z^2}{z^2-1}} \right) ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0077.01

$$\tanh^{-1}(z) = \pi i - i \sin^{-1} \left(\sqrt{\frac{z^2}{z^2-1}} \right) ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0078.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\sqrt{1-z^2} + 1} / (\sqrt{2} (1-z^2)^{1/4}) \right)$

01.27.27.0079.01

$$\tanh^{-1}(z) = -2 i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) + \pi i ; 0 < \arg(z) \leq \pi$$

01.27.27.0080.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.0081.01

$$\tanh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(-\pi + 2 \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} (1-z^2)^{1/4}} \right) \right)$$

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} (1-z^2)^{1/4}} \right)$

01.27.27.0082.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0083.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; -\pi < \arg(z) \leq 0$$

01.27.27.0084.01

$$\tanh^{-1}(z) = -\frac{2\sqrt{-z^2}}{z} \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\frac{\sqrt{(\sqrt{1-z^2} + 1)}}{2\sqrt{1-z^2}} \right)$

01.27.27.0085.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}} \right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.0086.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) + \pi i /; 0 < \arg(z) \leq \pi$$

01.27.27.0087.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\left(\sqrt{1-z^2} - 1 \right) / \left(2\sqrt{1-z^2} \right)} \right)$

01.27.27.0088.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} - 1}{2\sqrt{1-z^2}}} \right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0089.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} - 1}{2\sqrt{1-z^2}}} \right) /; -\pi < \arg(z) \leq 0$$

01.27.27.0090.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\sqrt{z^2-1} + z} / \left(\sqrt{2} (z^2-1)^{1/4} \right) \right)$

01.27.27.0091.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2} (z^2-1)^{1/4}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0092.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2} (z^2-1)^{1/4}} \right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0093.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} + z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) - \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0094.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} + z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0095.01

$$\tanh^{-1}(z) = 2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} + z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) - \frac{\pi i}{2} \left(1 - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \sqrt{1-z} \sqrt{\frac{1}{1-z}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right)$

01.27.27.0096.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0097.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0098.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0099.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} (z^2 - 1)^{1/4}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0100.01

$$\tanh^{-1}(z) = -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sin^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2}(z^2-1)^{1/4}} \right) + \frac{\pi i}{2} \left(1-i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\left(\sqrt{z^2-1} + z \right) / \left(2\sqrt{z^2-1} \right)} \right)$

01.27.27.0101.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\sqrt{\frac{z + \sqrt{z^2-1}}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0102.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{z + \sqrt{z^2-1}}{2\sqrt{z^2-1}}} \right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0103.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1} + z}{2\sqrt{z^2-1}}} \right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0104.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1} + z}{2\sqrt{z^2-1}}} \right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0105.01

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

Involving $\tanh^{-1}(z)$ and $\sin^{-1} \left(\sqrt{\left(\sqrt{z^2-1} - z \right) / \left(2\sqrt{z^2-1} \right)} \right)$

01.27.27.0106.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}} \right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0107.01

$$\tanh^{-1}(z) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0108.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0109.01

$$\tanh^{-1}(z) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0110.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{1+z}{1-z}\right)$

01.27.27.0111.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1} \left(\frac{z+1}{1-z} \right) + \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi$$

01.27.27.0112.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1} \left(\frac{1+z}{1-z} \right) - \frac{\pi i}{4} ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0113.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1} \left(\frac{1+z}{1-z} \right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0114.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{z+1}{z-1}\right)$

01.27.27.0115.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1} \left(\frac{z+1}{z-1} \right) + \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi$$

01.27.27.0116.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1}\left(\frac{z+1}{z-1}\right) - \frac{\pi i}{4}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0117.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1}\left(\frac{z+1}{z-1}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0118.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$

01.27.27.0119.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right); |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0120.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0121.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right); |z| < 1$$

01.27.27.0122.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) + \frac{\pi i}{2}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0123.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{2}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0124.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi\sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.0125.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \right) - \frac{\sqrt{-z^2}(1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$

01.27.27.0126.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0127.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0128.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| < 1$$

01.27.27.0129.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{\pi i}{2} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0130.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{2} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0131.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi \sqrt{-z^2}}{2z} /; |z| > 1$$

01.27.27.0132.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi \sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2}\right) + \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

01.27.27.0133.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.0134.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.0135.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

01.27.27.0136.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0137.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0138.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0139.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

01.27.27.0140.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); 0 < \arg(z) \leq \pi \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0141.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); \text{Im}(z) < 0$$

01.27.27.0142.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0143.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

01.27.27.0144.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0145.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0146.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0147.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

01.27.27.0148.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0149.01

$$\tanh^{-1}(\sqrt{z}) = -i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0150.01

$$\tanh^{-1}(\sqrt{z}) = i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0151.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{(\sqrt{2} (1-z)^{1/4})}\right)$

01.27.27.0152.01

$$\tanh^{-1}(\sqrt{z}) = -2 i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \pi i /; 0 < \arg(z) \leq \pi$$

01.27.27.0153.01

$$\tanh^{-1}(\sqrt{z}) = 2 i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.0154.01

$$\tanh^{-1}(\sqrt{z}) = \frac{2 \sqrt{-z^2}}{z} \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi \sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - 1}}{(\sqrt{2} (1-z)^{1/4})}\right)$

01.27.27.0155.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}} \right); 0 < \arg(z) \leq \pi$$

01.27.27.0156.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}} \right); -\pi < \arg(z) \leq 0$$

01.27.27.0157.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2\sqrt{-z^2}}{z} \sin^{-1} \left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1} \left(\sqrt{(\sqrt{1-z}+1)/(2\sqrt{1-z})} \right)$

01.27.27.0158.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}} \right) + \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.0159.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}} \right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.0160.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1} \left(\sqrt{(\sqrt{1-z}-1)/(2\sqrt{1-z})} \right)$

01.27.27.0161.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}} \right); 0 < \arg(z) \leq \pi$$

01.27.27.0162.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}} \right); -\pi < \arg[z] \leq 0$$

01.27.27.0163.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0164.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0165.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0166.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0167.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi \sqrt{-z^2}}{z} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2} \right) - \frac{2\sqrt{-z^2} \sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0168.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0169.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.0170.01

$$\tanh^{-1}(\sqrt{z}) = \frac{2\sqrt{-z^2}}{z} \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi \sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1}\left(\frac{\sqrt{(\sqrt{1-z} + \sqrt{-z})/(2\sqrt{1-z})}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0171.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0172.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}} \right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0173.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}} \right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0174.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}} \right)$

01.27.27.0175.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}} \right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0176.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}} \right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0177.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sin^{-1} \left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}} \right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0178.01

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

Involving $\tanh^{-1} \left(\frac{1}{\sqrt{z}} \right)$

Involving $\tanh^{-1} \left(\frac{1}{\sqrt{z}} \right)$ and $\sin^{-1} \left(\frac{1+z}{1-z} \right)$

01.27.27.0179.01

$$\tanh^{-1} \left(\frac{1}{\sqrt{z}} \right) = -\frac{i}{2} \sin^{-1} \left(\frac{z+1}{1-z} \right) - \frac{\pi i}{4}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0180.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sin^{-1}\left(\frac{z+1}{1-z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0$$

01.27.27.0181.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sin^{-1}\left(\frac{z+1}{1-z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0182.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{z+1}{z-1}\right)$

01.27.27.0183.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{z+1}{z-1}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0184.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \sin^{-1}\left(\frac{z+1}{z-1}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0$$

01.27.27.0185.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \sin^{-1}\left(\frac{z+1}{z-1}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0186.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$

01.27.27.0187.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{2} ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0188.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) + \frac{\pi i}{2} ; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.0189.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0190.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi\sqrt{z}}{2} \sqrt{-\frac{1}{z}} \quad ; |z| < 1$$

01.27.27.0191.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) \quad ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0192.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) \quad ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0193.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) \quad ; |z| > 1$$

01.27.27.0194.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) - \frac{\sqrt{-z^2}(z+1)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sin^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) \quad ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$

01.27.27.0195.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2}i \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{2} \quad ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0196.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{\pi i}{2} \quad ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.0197.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{2} \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0198.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi\sqrt{z}}{2} \sqrt{-\frac{1}{z}} \quad ; |z| < 1$$

01.27.27.0199.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) \quad ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0200.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) \quad ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0201.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| > 1$$

01.27.27.0202.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} + 1 \right) + \frac{\sqrt{-z^2}(z+1)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sin^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

01.27.27.0203.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0204.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0205.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0206.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

01.27.27.0207.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0208.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; \text{Im}(z) < 0$$

01.27.27.0209.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0210.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

01.27.27.0211.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.0212.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.0213.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

01.27.27.0214.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0215.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.0216.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0217.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

01.27.27.0218.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0219.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.0220.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sin^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0221.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0222.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}(1-z)^{1/4}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0223.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0224.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0225.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{2\sqrt{-z^2}}{z}\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi\left(\frac{\sqrt{z-1}}{2\sqrt{1-z}} + \frac{\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0226.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0227.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0228.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0229.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{2\sqrt{-z^2}}{z}\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right)$

01.27.27.0230.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0231.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0232.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0233.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right)$

01.27.27.0234.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0235.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0236.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0237.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{\sqrt{1-z}+\sqrt{-z}}{\sqrt{2}(1-z)^{1/4}}}\right)$

01.27.27.0238.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) - \pi i /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0239.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) + \pi i /; \operatorname{Im}(z) < 0$$

01.27.27.0240.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0241.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + 2i \sqrt{z} \sqrt{-\frac{1}{z}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) - \frac{2\sqrt{-z^2} \sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right)$

01.27.27.0242.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0243.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0244.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0245.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1\right) + \frac{2\sqrt{-z^2}}{z} \sin^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\frac{\sqrt{(\sqrt{1-z} + \sqrt{-z})}}{2\sqrt{1-z}}\right)$

01.27.27.0246.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0247.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) + \pi i /; \operatorname{Im}(z) < 0$$

01.27.27.0248.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0249.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sin^{-1}\left(\sqrt{(\sqrt{1-z} - \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.0250.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0251.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.0252.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sin^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0253.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0254.01

$$\tanh^{-1}(\sqrt{1-z}) = -\frac{\pi i}{2} + i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0255.01

$$\tanh^{-1}(\sqrt{1-z}) = \frac{\pi i}{2} - i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0256.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0257.01

$$\tanh^{-1}(\sqrt{1-z}) = -\frac{\pi i}{2} + i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0258.01

$$\tanh^{-1}(\sqrt{1-z}) = \frac{\pi i}{2} - i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0259.01

$$\tanh^{-1}(\sqrt{1-z}) = -\frac{\pi i}{2} - i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0260.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0261.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0262.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0263.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0264.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0265.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0266.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0267.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0268.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\sin^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0269.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0270.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.0271.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0272.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\sin^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0273.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0274.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0275.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0276.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0277.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0278.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(\sqrt{z}); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0279.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0280.01

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

01.27.27.0281.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0282.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0$$

01.27.27.0283.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.27.27.0284.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0285.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0286.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0287.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0288.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0289.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0290.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \sin^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0291.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0$$

01.27.27.0292.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \sin^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0293.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0294.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \sin^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.27.27.0295.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0296.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \sin^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0297.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\sin^{-1}(\sqrt{z})$

01.27.27.0298.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \sin^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.27.27.0299.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \sin^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0300.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \sin^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0301.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0302.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{i}{2} \sin^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0303.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} i \sin^{-1}(z) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0$$

01.27.27.0304.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} i \sin^{-1}(z) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0305.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0306.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \sin^{-1}(z) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0307.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{i}{2} \sin^{-1}(z) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0308.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \sin^{-1}(z) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.0309.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + \frac{i\sqrt{1-z}}{2\sqrt{z-1}} - 1 \right) + \frac{\sqrt{1-z}}{2\sqrt{z-1}} \sin^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\sin^{-1}(z)$

$$\text{01.27.27.0310.01} \\ \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} i \sin^{-1}(z) - \frac{\pi i}{4} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.0311.01} \\ \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \sin^{-1}(z) + \frac{\pi i}{4} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

$$\text{01.27.27.0312.01} \\ \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \sin^{-1}(z) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.0313.01} \\ \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \sin^{-1}(z) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\sin^{-1}(z)$

$$\text{01.27.27.0314.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \sin^{-1}(z) + \frac{\pi i}{4} ; \text{Im}(z) > 0$$

$$\text{01.27.27.0315.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{i}{2} \sin^{-1}(z) - \frac{\pi i}{4} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

$$\text{01.27.27.0316.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \sin^{-1}(z) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.0317.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{4} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + i\sqrt{-z} \sqrt{\frac{1}{z}} - 1 \right) + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \sin^{-1}(z)$$

01.27.27.0318.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0319.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} i \sin^{-1}(z) - \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0320.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \sin^{-1}(z) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0321.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \sin^{-1}(z) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0322.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \sin^{-1}(z) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{-1+z^2}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-1-z}}{2\sqrt{1+z}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0323.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \sin^{-1}(z) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0324.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{i}{2} \sin^{-1}(z) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0325.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \sin^{-1}(z) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0326.01

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

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0327.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0328.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0329.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0330.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0331.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \frac{z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sin^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{1-z^2}}{2 \sqrt{z^2-1}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0332.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \sin^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0333.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0334.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0335.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \sin^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0336.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0337.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \sin^{-1}\left(\frac{1}{z}\right) /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0338.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0339.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \sin^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0340.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \sin^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0341.01

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

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

Involving $\tanh^{-1}\left(z \sqrt{\frac{1-z^2}{z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0342.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + i \sin^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0343.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - i \sin^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.0344.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - i \sin^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.0345.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + i \sin^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0346.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0347.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \sin^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0348.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \sin^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0349.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \sin^{-1}(z) + \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0350.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \sin^{-1}(z) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0013.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \sin^{-1}(z) ; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.0014.02

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0351.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \sin^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0352.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \sin^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0353.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \sin^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0354.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \sin^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0355.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\sin^{-1}(z)$

01.27.27.0356.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \sin^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0357.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \sin^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0358.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \sin^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0359.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \sin^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0360.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0361.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \sin^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0362.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \sin^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0363.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \sin^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0364.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \sin^{-1}(z) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0365.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\sin^{-1}(z)$

01.27.27.0366.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi i}{2} - i \sin^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.0367.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\frac{\pi i}{2} + i \sin^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0368.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi i}{2} + i \sin^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0369.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\frac{\pi i}{2} - i \sin^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.0370.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\sin^{-1}(z)$

01.27.27.0371.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - i \sin^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0372.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \quad \bigvee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0373.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \quad \bigvee \quad (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0374.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + i \sin^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0375.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\sin^{-1}(z)$

01.27.27.0376.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - i \sin^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.0377.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.0378.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.0379.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i \sin^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.0380.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\sin^{-1}(z)$

01.27.27.0381.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi i}{2} - i \sin^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0382.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + i \sin^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0383.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - i \sin^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0384.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi i}{2} + i \sin^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0385.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2}+1}{z}\right)$ and $\sin^{-1}(iz)$

01.27.27.0386.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = -\frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}(iz) /; 0 \leq \arg(z) < \pi$$

01.27.27.0387.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = \frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}(i z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0388.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2}-1}{z}\right)$ and $\sin^{-1}(i z)$

01.27.27.0389.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right)$ and $\sin^{-1}(i z)$

01.27.27.0390.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right)$ and $\sin^{-1}(i z)$

01.27.27.0391.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}(i z) ; 0 \leq \arg(z) < \pi$$

01.27.27.0392.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}(i z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0393.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0394.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2i \sin^{-1}\left(\frac{1}{z}\right); |z| > \sqrt{2} \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0395.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = 2i \sin^{-1}\left(\frac{1}{z}\right); |z| > \sqrt{2} \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0396.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\pi \left(\theta \left(\left| \sqrt{z^2-1} \right| - 1 \right) - 1 \right) + \frac{2\sqrt{z^2}}{z} \sin^{-1}\left(\frac{1}{z}\right) \right)$$

01.27.27.0397.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \right. \right. \\ & \left. \left. \sqrt{\frac{-i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \sin^{-1}\left(\frac{1}{z}\right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.27.27.0398.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - 2i \sin^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.0399.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + 2i \sin^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0400.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - 2i \sin^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \quad (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0401.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + 2i \sin^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0402.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$ and $\sin^{-1}(z)$

01.27.27.0403.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = 2i \sin^{-1}(z); \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2} \vee -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0404.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) &= \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(2 \sin^{-1}(z) - \right. \\ &\left. \frac{\pi}{2} \left(\frac{\sqrt{z^2-1} z}{\sqrt{z^4-z^2}} + \sqrt{\frac{1}{z}} \sqrt{\frac{1}{\sqrt{2} z-1}} \sqrt{\sqrt{2} z-1} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\sqrt{2} z-1} \sqrt{-\frac{1}{\sqrt{2} z+1}} + \frac{\sqrt{z^2}}{z}\right)\right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$ and $\sin^{-1}(z)$

01.27.27.0405.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + 2i \sin^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.0406.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2i \sin^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0407.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - 2i \sin^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.0408.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2i \sin^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.0409.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2i \sin^{-1}(z) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0410.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} - 2i \sin^{-1}(z) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0411.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} \left(-\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{-iz} \sqrt{\frac{i}{z}} + \sqrt{-\frac{i}{z}} \sqrt{iz} + \frac{\sqrt{z^2}}{z} \right) - 2 \sin^{-1}(z) \right)$$

Involving \cos^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{2iz}{1-z^2}\right)$

01.27.27.0412.01

$$\tanh^{-1}(z) = \frac{i}{2} \left(\cos^{-1}\left(\frac{2iz}{1-z^2}\right) - \frac{\pi}{2} \right) /; |z| < 1$$

01.27.27.0413.01

$$\tanh^{-1}(z) = -\frac{i}{2} \cos^{-1}\left(\frac{2iz}{1-z^2}\right) + \frac{3\pi i}{4} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0414.01

$$\tanh^{-1}(z) = -\frac{i}{2} \cos^{-1}\left(\frac{2iz}{1-z^2}\right) - \frac{\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0415.01

$$\tanh^{-1}(z) = \frac{\pi}{2} \left(-\frac{\sqrt{-z^2}}{z} + \frac{i}{2} \right) - \frac{1}{2} i \cos^{-1}\left(\frac{2iz}{1-z^2}\right); |z| > 1$$

01.27.27.0416.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 \left(\frac{\sqrt{-z^2}}{z} - i\right) - \frac{\sqrt{-z^2}}{z}} \right) + \frac{i(1-z)}{2(1+z)} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \cos^{-1}\left(\frac{2iz}{1-z^2}\right); |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{2iz}{z^2-1}\right)$

01.27.27.0417.01

$$\tanh^{-1}(z) = \frac{i}{2} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2iz}{z^2-1}\right) \right); |z| < 1$$

01.27.27.0418.01

$$\tanh^{-1}(z) = \frac{i}{2} \cos^{-1}\left(\frac{2iz}{z^2-1}\right) + \frac{\pi i}{4}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0419.01

$$\tanh^{-1}(z) = \frac{i}{2} \cos^{-1}\left(\frac{2iz}{z^2-1}\right) - \frac{3\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0420.01

$$\tanh^{-1}(z) = -\frac{\pi}{2} \left(\frac{\sqrt{-z^2}}{z} + \frac{i}{2} \right) + \frac{1}{2} i \cos^{-1}\left(\frac{2iz}{z^2-1}\right); |z| > 1$$

01.27.27.0421.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 \left(\frac{\sqrt{-z^2}}{z} + i\right) - \frac{\sqrt{-z^2}}{z}} \right) - \frac{i(1-z)}{2(1+z)} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \cos^{-1}\left(\frac{2iz}{z^2-1}\right); |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{1+z^2}{1-z^2}\right)$

01.27.27.0422.01

$$\tanh^{-1}(z) = -\frac{i}{2} \cos^{-1}\left(\frac{1+z^2}{1-z^2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0423.01

$$\tanh^{-1}(z) = \frac{1}{2} i \cos^{-1}\left(\frac{z^2+1}{1-z^2}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0424.01

$$\tanh^{-1}(z) = -\pi i + \frac{1}{2} i \cos^{-1}\left(\frac{z^2 + 1}{1 - z^2}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0425.01

$$\tanh^{-1}(z) = \pi i - \frac{1}{2} i \cos^{-1}\left(\frac{z^2 + 1}{1 - z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0426.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{z^2+1}{z^2-1}\right)$

01.27.27.0427.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \frac{i}{2} \cos^{-1}\left(\frac{z^2 + 1}{z^2 - 1}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0428.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{i}{2} \cos^{-1}\left(\frac{z^2 + 1}{z^2 - 1}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0429.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{i}{2} \cos^{-1}\left(\frac{z^2 + 1}{z^2 - 1}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0430.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \frac{i}{2} \cos^{-1}\left(\frac{z^2 + 1}{z^2 - 1}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0431.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

01.27.27.0432.01

$$\tanh^{-1}(z) = -i \cos^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.0433.01

$$\tanh^{-1}(z) = i \cos^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0434.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

01.27.27.0435.01

$$\tanh^{-1}(z) = -i \cos^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0436.01

$$\tanh^{-1}(z) = i \cos^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0437.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

01.27.27.0438.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0439.01

$$\tanh^{-1}(z) = i \cos^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0440.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \cos^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0441.01

$$\tanh^{-1}(z) = \frac{3\pi i}{2} - i \cos^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0442.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

01.27.27.0443.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0444.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + i \cos^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0445.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0446.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \cos^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0447.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

01.27.27.0448.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0449.01

$$\tanh^{-1}(z) = i \cos^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0450.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0451.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \cos^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0452.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

01.27.27.0453.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0454.01

$$\tanh^{-1}(z) = i \cos^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0455.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0456.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \cos^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0457.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\sqrt{1-z^2} + 1} / (\sqrt{2} (1-z^2)^{1/4})\right)$

01.27.27.0458.01

$$\tanh^{-1}(z) = 2 i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0459.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; -\pi < \arg(z) \leq 0$$

01.27.27.0460.01

$$\tanh^{-1}(z) = -\frac{2\sqrt{-z^2}}{z} \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} (1-z^2)^{1/4}} \right)$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\sqrt{\sqrt{1-z^2} - 1} / (\sqrt{2} (1-z^2)^{1/4}) \right)$

01.27.27.0461.01

$$\tanh^{-1}(z) = \pi i - 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0462.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.0463.01

$$\tanh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(2 \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) - \pi \right)$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\sqrt{(\sqrt{1-z^2} + 1)} / (2\sqrt{1-z^2}) \right)$

01.27.27.0464.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0465.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) ; -\pi < \arg(z) \leq 0$$

01.27.27.0466.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} - 1}{2\sqrt{1-z^2}}} \right)$

01.27.27.0467.01

$$\tanh^{-1}(z) = \pi i - 2i \cos^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} - 1}{2\sqrt{1-z^2}}} \right) ; 0 < \arg(z) \leq \pi$$

01.27.27.0468.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} - 1}{2\sqrt{1-z^2}}} \right) - \pi i ; -\pi < \arg(z) \leq 0$$

01.27.27.0469.01

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

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\sqrt{\frac{\sqrt{z^2-1} + z}{\sqrt{2}(z^2-1)^{1/4}}} \right)$

01.27.27.0470.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2}(z^2-1)^{1/4}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0471.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2}(z^2-1)^{1/4}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0472.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2} (z^2-1)^{1/4}} \right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0473.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2} (z^2-1)^{1/4}} \right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0474.01

$$\begin{aligned} \tanh^{-1}(z) = & -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} + z}}{\sqrt{2} (z^2-1)^{1/4}} \right) - \\ & \frac{\pi i}{2} \left(1 + 2i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \sqrt{1-z} \sqrt{\frac{1}{1-z}} \right) \end{aligned}$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} - z}}{\sqrt{2} (z^2-1)^{1/4}} \right)$

01.27.27.0475.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} - z}}{\sqrt{2} (z^2-1)^{1/4}} \right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0476.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} - z}}{\sqrt{2} (z^2-1)^{1/4}} \right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0477.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1} - z}}{\sqrt{2} (z^2-1)^{1/4}} \right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0478.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2}(z^2-1)^{1/4}} \right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0479.01

$$\begin{aligned} \tanh^{-1}(z) = & 2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \cos^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2}(z^2-1)^{1/4}} \right) + \\ & \frac{\pi i}{2} \left(1 + 2i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right) \end{aligned}$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right)$

01.27.27.0480.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\sqrt{\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}} \right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0481.01

$$\tanh^{-1}(z) = 2i \cos^{-1} \left(\sqrt{\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0482.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0483.01

$$\tanh^{-1}(z) = -2i \cos^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0484.01

$$\tanh^{-1}(z) = -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \cos^{-1} \left(\sqrt{\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}} \right) + \left(1 - \frac{i\sqrt{z-1}z^{3/2}}{\sqrt{1-z}\sqrt{z^2}} \sqrt{\frac{1}{z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \right) \frac{\pi i}{2}$$

Involving $\tanh^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\left(\sqrt{z^2-1}-z\right)/\left(2\sqrt{z^2-1}\right)}\right)$

01.27.27.0485.01

$$\tanh^{-1}(z) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0486.01

$$\tanh^{-1}(z) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}}\right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0487.01

$$\tanh^{-1}(z) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0488.01

$$\tanh^{-1}(z) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}-z}{2\sqrt{z^2-1}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0489.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{1+z}{1-z}\right)$

01.27.27.0490.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{1+z}{1-z}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0491.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \cos^{-1}\left(\frac{1+z}{1-z}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0492.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{1+z}{1-z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0493.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{z+1}{z-1}\right)$

01.27.27.0494.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \cos^{-1}\left(\frac{z+1}{z-1}\right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.0495.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{z+1}{z-1}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0496.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \cos^{-1}\left(\frac{z+1}{z-1}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0497.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$

01.27.27.0498.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0499.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0500.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \left(\cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi}{2} \right) /; |z| < 1$$

01.27.27.0501.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) + \frac{\pi i}{4} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0502.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0503.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi \sqrt{-z^2}}{4z} /; |z| > 1$$

01.27.27.0504.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi\sqrt{-z^2}}{4z} ; |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$

01.27.27.0505.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{4} ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0506.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0507.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) \right) ; |z| < 1$$

01.27.27.0508.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{3\pi i}{4} ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0509.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi i}{4} ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0510.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi\sqrt{-z^2}}{4z} ; |z| > 1$$

01.27.27.0511.01

$$\tanh^{-1}(\sqrt{z}) = \left(-1 + 2 \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \right) \frac{\pi\sqrt{-z^2}}{4z} - \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

01.27.27.0512.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right) ; 0 < \arg(z) \leq \pi$$

01.27.27.0513.01

$$\tanh^{-1}(\sqrt{z}) = -i \cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right) ; -\pi < \arg(z) \leq 0$$

01.27.27.0514.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

01.27.27.0515.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0516.01

$$\tanh^{-1}(\sqrt{z}) = -i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0517.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0518.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

01.27.27.0519.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) /; 0 < \arg(z) \leq \pi \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0520.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2} /; \text{Im}(z) < 0$$

01.27.27.0521.01

$$\tanh^{-1}(\sqrt{z}) = -i \cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0522.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

01.27.27.0523.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0524.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0525.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} - i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0526.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

01.27.27.0527.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0528.01

$$\tanh^{-1}(\sqrt{z}) = i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0529.01

$$\tanh^{-1}(\sqrt{z}) = -i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0530.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{(\sqrt{2}(1-z)^{1/4})}\right)$

01.27.27.0531.01

$$\tanh^{-1}(\sqrt{z}) = 2 i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2} \sqrt[4]{1-z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0532.01

$$\tanh^{-1}(\sqrt{z}) = -2 i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2} \sqrt[4]{1-z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.0533.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2\sqrt{-z^2}}{z} \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}\sqrt[4]{1-z}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.0534.01

$$\tanh^{-1}(\sqrt{z}) = \pi i - 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0535.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.0536.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{z} \left(2 \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{(\sqrt{1-z}+1)/(2\sqrt{1-z})}}{\sqrt{2}\sqrt{1-z}}\right)$

01.27.27.0537.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0538.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.0539.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{\sqrt{(\sqrt{1-z}-1)/(2\sqrt{1-z})}}{\sqrt{2}\sqrt{1-z}}\right)$

01.27.27.0540.01

$$\tanh^{-1}(\sqrt{z}) = \pi i - 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0541.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1} \left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}} \right) - \pi i /; -\pi < \arg[z] \leq 0$$

01.27.27.0542.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right)$

01.27.27.0543.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.0544.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0545.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0546.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{2\sqrt{-z^2}} + \frac{2\sqrt{-z^2}\sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right)$

01.27.27.0547.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.0548.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.0549.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2\sqrt{-z^2}}{z} \cos^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) + \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\sqrt{(\sqrt{1-z} + \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.0550.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0551.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0552.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0553.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\sqrt{(\sqrt{1-z} - \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.0554.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0555.01

$$\tanh^{-1}(\sqrt{z}) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0556.01

$$\tanh^{-1}(\sqrt{z}) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0557.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{1+z}{1-z}\right)$

01.27.27.0558.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{z+1}{1-z}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0559.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \cos^{-1}\left(\frac{z+1}{1-z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.0560.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \cos^{-1}\left(\frac{z+1}{1-z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0561.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{z+1}{z-1}\right)$

01.27.27.0562.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \cos^{-1}\left(\frac{z+1}{z-1}\right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0563.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \cos^{-1}\left(\frac{z+1}{z-1}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.0564.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \cos^{-1}\left(\frac{z+1}{z-1}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0565.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$

01.27.27.0566.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0567.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) + \frac{\pi i}{4} /; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.0568.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0569.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi}{2} \left(\sqrt{z} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z^2}}{2z} \right) ; |z| < 1$$

01.27.27.0570.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0571.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} - \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0572.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) \right) ; |z| > 1$$

01.27.27.0573.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \cos^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi}{4} \left(\frac{i(1+z)}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \left(1 - \sqrt{-z} \sqrt{-\frac{1}{z}} \right) + \sqrt{-\frac{1}{z}} \sqrt{z} \right) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$

01.27.27.0574.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi i}{4} ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0575.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{3\pi i}{4} ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.0576.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0577.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{-z^2}}{2z} - \sqrt{z} \sqrt{-\frac{1}{z}} \right) - \frac{\sqrt{-z^2}}{2z} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| < 1$$

01.27.27.0578.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} - \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0579.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{4} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0580.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \left(\cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi}{2} \right) /; |z| > 1$$

01.27.27.0581.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}(1+z)}{2(z(1-z))} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) \right) - \frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} + 1 \right) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

01.27.27.0582.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.0583.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0584.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \cos^{-1}\left(\frac{1}{\sqrt{1-z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0585.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

01.27.27.0586.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0587.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.0588.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \cos^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0589.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

01.27.27.0590.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); \text{Im}(z) \geq 0$$

01.27.27.0591.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); \text{Im}(z) < 0$$

01.27.27.0592.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

01.27.27.0593.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0594.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); \text{Im}(z) < 0$$

01.27.27.0595.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0596.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

01.27.27.0597.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0598.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right); \operatorname{Im}(z) < 0$$

01.27.27.0599.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cos^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0600.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} (1-z)^{1/4}}\right)$

01.27.27.0601.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} (1-z)^{1/4}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0602.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} (1-z)^{1/4}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0603.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} (1-z)^{1/4}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0604.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{2\sqrt{-z^2}}{z} \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} (1-z)^{1/4}}\right) - \frac{\pi \sqrt{-1+z}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} (1-z)^{1/4}}\right)$

01.27.27.0605.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} (1-z)^{1/4}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0606.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0607.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0608.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{2\sqrt{-z^2}}{z} \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-1+z}}{\sqrt{1-z}} + \frac{2\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right)$

01.27.27.0609.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0610.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0611.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0612.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right)$

01.27.27.0613.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.0614.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0615.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0616.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{(\sqrt{2}(1-z)^{1/4})}\right)$

01.27.27.0617.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0618.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right); \operatorname{Im}(z) < 0$$

01.27.27.0619.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0620.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2}\left(1 - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + \frac{2\sqrt{-z^2} \sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{(\sqrt{2}(1-z)^{1/4})}\right)$

01.27.27.0621.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.0622.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i - 2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0623.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0624.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - \frac{2i\sqrt{-z^2}}{z} - 1 \right) - \frac{2\sqrt{-z^2}}{z} \cos^{-1}\left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{(\sqrt{1-z} + \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.0625.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0626.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right); \operatorname{Im}(z) < 0$$

01.27.27.0627.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0628.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(\sqrt{(\sqrt{1-z} - \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.0629.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0630.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i - 2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right); \operatorname{Im}(z) < 0$$

01.27.27.0631.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \cos^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0632.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0633.01

$$\tanh^{-1}(\sqrt{1-z}) = -i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0634.01

$$\tanh^{-1}(\sqrt{1-z}) = i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0635.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0636.01

$$\tanh^{-1}(\sqrt{1-z}) = -i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0637.01

$$\tanh^{-1}(\sqrt{1-z}) = i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0638.01

$$\tanh^{-1}(\sqrt{1-z}) = -\pi i + i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0639.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0640.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0641.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0642.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0643.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0644.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0645.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0646.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0647.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0648.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0649.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.0650.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0651.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0652.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0653.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0654.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0655.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.27.27.0656.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \cos^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.0657.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -i \cos^{-1}(\sqrt{z}) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.0658.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\pi i + i \cos^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.0659.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z} - 1} \right) + \frac{\sqrt{z-1}}{\sqrt{1-z}} \cos^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\cos^{-1}(\sqrt{z})$

$$\text{01.27.27.0660.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \cos^{-1}(\sqrt{z}) /; \text{Im}(z) > 0$$

$$\text{01.27.27.0661.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \cos^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

$$\text{01.27.27.0662.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\pi i + i \cos^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.0663.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \left(\sqrt{z} \sqrt{\frac{1}{z} - 1} \right) \frac{\pi i}{2} - \frac{\sqrt{-z}}{\sqrt{z}} \cos^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\cos^{-1}(\sqrt{z})$

$$\text{01.27.27.0664.01} \\ \tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \cos^{-1}(\sqrt{z}) /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0665.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \cos^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0666.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\pi i + i \cos^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0667.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.27.27.0668.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0669.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - i \cos^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0$$

01.27.27.0670.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0671.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.27.27.0672.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.0673.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \cos^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.0674.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.0675.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi \sqrt{1-z} \sqrt{-z}}{2 \sqrt{z}} \sqrt{\frac{1}{1-z}} - \frac{\sqrt{-z^2}}{z} \cos^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\cos^{-1}(\sqrt{z})$

$$\text{01.27.27.0676.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \pi$$

$$\text{01.27.27.0677.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi i}{2} - i \cos^{-1}(\sqrt{z}) ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.0678.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \cos^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.0679.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi \sqrt{-z} \sqrt{1-z}}{2 \sqrt{z}} \sqrt{\frac{1}{1-z}} - \frac{\sqrt{-z^2}}{z} \cos^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\cos^{-1}(z)$

$$\text{01.27.27.0680.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{i}{2} \cos^{-1}(z) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.0681.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{1}{2} i \cos^{-1}(z) + \frac{\pi i}{2} ; \text{Im}(z) < 0$$

$$\text{01.27.27.0682.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{1}{2} i \cos^{-1}(z) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0683.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0684.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{i}{2} \cos^{-1}(z) ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0685.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \cos^{-1}(z) ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0686.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{i}{2} \cos^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0687.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\cos^{-1}(z)$

01.27.27.0688.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \cos^{-1}(z) - \frac{\pi i}{2} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0689.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} i \cos^{-1}(z) + \frac{\pi i}{2} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0690.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} i \cos^{-1}(z) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0691.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\cos^{-1}(z)$

01.27.27.0692.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{i}{2} \cos^{-1}(z) \ ; \ \text{Im}(z) > 0$$

01.27.27.0693.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \cos^{-1}(z) \ ; \ \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.0694.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{i}{2} \cos^{-1}(z) - \pi i \ ; \ (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0695.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0696.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \cos^{-1}(z) - \frac{\pi i}{2} \ ; \ \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0697.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} i \cos^{-1}(z) + \frac{\pi i}{2} \ ; \ \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0698.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} i \cos^{-1}(z) - \frac{\pi i}{2} \ ; \ (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0699.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0700.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{i}{2} \cos^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0701.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \cos^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0702.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{i}{2} \cos^{-1}(z) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0703.01

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

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0704.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0705.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0706.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \cos^{-1}\left(\frac{1}{z}\right) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0707.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \cos^{-1}\left(\frac{1}{z}\right) - \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0708.01

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

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0709.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0710.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0711.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \cos^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0712.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0713.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0714.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0715.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0716.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \cos^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0717.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0718.01

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

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

Involving $\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0719.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0720.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = i\cos^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (iz \in \mathbb{R} \wedge iz < 0)$$

01.27.27.0721.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\pi i + i\cos^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (iz \in \mathbb{R} \wedge iz > 0)$$

01.27.27.0722.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \pi i - i\cos^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0723.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0724.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i\cos^{-1}(z) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0725.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - i \cos^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0726.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \cos^{-1}(z) + \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0727.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \cos^{-1}(z) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0728.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} - \cos^{-1}(z)\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.0729.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0730.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \cos^{-1}(z) - \frac{\pi i}{2} /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0731.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - i \cos^{-1}(z) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0732.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \cos^{-1}(z) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0733.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \cos^{-1}(z) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0734.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\cos^{-1}(z)$

01.27.27.0735.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \cos^{-1}(z) - \frac{\pi i}{2} \text{ ; } \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0736.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i \cos^{-1}(z) \text{ ; } \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0737.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \cos^{-1}(z) - \frac{3\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0738.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \cos^{-1}(z) - \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0739.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0740.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \cos^{-1}(z) - \frac{\pi i}{2} \text{ ; } \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0741.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi i}{2} - i \cos^{-1}(z) \text{ ; } \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0742.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \cos^{-1}(z) - \frac{3\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0743.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \cos^{-1}(z) - \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0744.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\cos^{-1}(z)$

01.27.27.0745.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \cos^{-1}(z) \text{ ; } 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.0746.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \cos^{-1}(z) \text{ ; } -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0747.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \pi i - i \cos^{-1}(z) \text{ ; } \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0748.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\pi i + i \cos^{-1}(z) \text{ ; } -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.0015.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\cos^{-1}(z)$

01.27.27.0749.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = i \cos^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0750.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i \cos^{-1}(z) ; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0751.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\pi i + i \cos^{-1}(z) ; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0752.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi i - i \cos^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0753.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\cos^{-1}(z)$

01.27.27.0754.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \cos^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.0755.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i \cos^{-1}(z) ; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.0756.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\pi i + i \cos^{-1}(z) ; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.0757.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \pi i - i \cos^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.0758.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\cos^{-1}(z)$

01.27.27.0759.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \cos^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0760.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -i \cos^{-1}(z) ; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0761.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\pi i + i \cos^{-1}(z) ; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0762.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi i - i \cos^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0763.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+1}}{z}\right)$ and $\cos^{-1}(iz)$

01.27.27.0764.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{3\pi i}{4} + \frac{1}{2}i \cos^{-1}(iz) ; 0 \leq \arg(z) < \pi$$

01.27.27.0765.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{\pi i}{4} + \frac{1}{2}i \cos^{-1}(iz) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0766.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2-1}}{z}\right)$ and $\cos^{-1}(iz)$

01.27.27.0767.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right)$ and $\cos^{-1}(iz)$

01.27.27.0768.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right)$ and $\cos^{-1}(iz)$

01.27.27.0769.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{3\pi i}{4} + \frac{1}{2}i \cos^{-1}(iz); 0 \leq \arg(z) < \pi$$

01.27.27.0770.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{4} + \frac{1}{2}i \cos^{-1}(iz); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0771.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0772.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = 2i \cos^{-1}\left(\frac{1}{z}\right) - \pi i; |z| > \sqrt{2} \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0773.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \pi i - 2i \cos^{-1}\left(\frac{1}{z}\right); |z| > \sqrt{2} \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0774.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\theta \left(\left| \sqrt{z^2-1} \right| - 1 \right) + \frac{\sqrt{z^2}}{z} - 1 \right) \pi - \frac{2\sqrt{z^2}}{z} \cos^{-1}\left(\frac{1}{z}\right)$$

01.27.27.0775.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \right. \right. \\ & \left. \left. \sqrt{-\frac{i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right) \right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.27.27.0776.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + 2i \cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.0777.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - 2i \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0778.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{3\pi i}{2} + 2i \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0779.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{3\pi i}{2} - 2i \cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0780.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$ and $\cos^{-1}(z)$

01.27.27.0781.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i - 2i \cos^{-1}(z) /; \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2} \vee -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0782.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\pi i + 2i \cos^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \frac{3\pi}{4} \vee -\frac{\pi}{2} < \arg(z) \leq -\frac{\pi}{4}$$

01.27.27.0783.01

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

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

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$ and $\cos^{-1}(z)$

01.27.27.0784.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2i\cos^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (iz \in \mathbb{R} \wedge iz > 0)$$

01.27.27.0785.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + 2i\cos^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.0786.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} + 2i\cos^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.0787.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2i\cos^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (iz \in \mathbb{R} \wedge iz < 0)$$

01.27.27.0788.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2i\cos^{-1}(z) ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0789.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{5\pi i}{2} + 2i\cos^{-1}(z) ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0790.01

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

Involving \tan^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\tan^{-1}(iz)$

01.27.27.0016.01

$$\tanh^{-1}(z) = -i \tan^{-1}(iz)$$

Involving $\tanh^{-1}(z)$ and $\tan^{-1}(-iz)$

01.27.27.0791.01

$$\tanh^{-1}(z) = i \tan^{-1}(-iz)$$

Involving $\tanh^{-1}(z)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0792.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{i}{z}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0793.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{i}{z}\right); \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0794.01

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

Involving $\tanh^{-1}(z)$ and $\tan^{-1}\left(-\frac{i}{z}\right)$

01.27.27.0795.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + i \tan^{-1}\left(-\frac{i}{z}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0796.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \tan^{-1}\left(-\frac{i}{z}\right); \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0797.01

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

Involving $\tanh^{-1}(iz)$

Involving $\tanh^{-1}(iz)$ and $\tan^{-1}(z)$

01.27.27.0017.01

$$\tanh^{-1}(iz) = i \tan^{-1}(z)$$

Involving $\tanh^{-1}(iz)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.27.27.0798.01

$$\tanh^{-1}(iz) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.0799.01

$$\tanh^{-1}(iz) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.0800.01

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

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0801.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -\frac{\pi i}{2} - i \tan^{-1}(iz); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0802.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \frac{\pi i}{2} - i \tan^{-1}(iz); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0803.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -i \tan^{-1}(iz) + \frac{\pi \sqrt{-z^2}}{2z}; z \notin (-1, 1)$$

01.27.27.0804.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -i \tan^{-1}(iz) - \frac{\pi i}{2} \operatorname{sgn}(\operatorname{Im}(z)); \operatorname{Im}(z) \neq 0$$

01.27.27.0805.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -i \tan^{-1}(iz) - \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2}$$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0806.01

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

Involving $\tanh^{-1}(\sqrt{-z})$

Involving $\tanh^{-1}(\sqrt{-z})$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0807.01

$$\tanh^{-1}(\sqrt{-z}) = -i \tan^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.27.27.0808.01

$$\tanh^{-1}(\sqrt{-z}) = i \tan^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.27.27.0018.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\sqrt{-z^2}}{z} \tan^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}(\sqrt{-z})$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0809.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0810.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.27.27.0811.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0812.01

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

Involving $\tanh^{-1}(\sqrt{-z})$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0813.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} + i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0814.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} - i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0815.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} - i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0816.01

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

Involving $\tanh^{-1}(\sqrt{-z})$ and $\tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.27.0817.01

$$\tanh^{-1}(\sqrt{-z}) = -i \tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0818.01

$$\tanh^{-1}(\sqrt{-z}) = i \tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.27.27.0819.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0820.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \tan^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0821.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.27.27.0822.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i \tan^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0823.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0824.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0825.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.0826.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0827.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0828.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.27.27.0829.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.27.0830.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.0831.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0832.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} + i \tan^{-1}\left(1/\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0833.01

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

Involving $\tanh^{-1}(\sqrt{z^2})$

Involving $\tanh^{-1}(\sqrt{z^2})$ and $\tan^{-1}(iz)$

01.27.27.0834.01

$$\tanh^{-1}(\sqrt{z^2}) = -i \tan^{-1}(iz); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.0835.01

$$\tanh^{-1}(\sqrt{z^2}) = i \tan^{-1}(iz); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0836.01

$$\tanh^{-1}(\sqrt{z^2}) = -\frac{\sqrt{z^2}}{z} i \tan^{-1}(iz)$$

Involving $\tanh^{-1}(\sqrt{z^2})$ and $\tan^{-1}(\frac{i}{z})$

01.27.27.0837.01

$$\tanh^{-1}(\sqrt{z^2}) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{i}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0838.01

$$\tanh^{-1}(\sqrt{z^2}) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0839.01

$$\tanh^{-1}(\sqrt{z^2}) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0840.01

$$\tanh^{-1}(\sqrt{z^2}) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{i}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0841.01

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

Involving $\tanh^{-1}(a(bz^c)^m)$

Involving $\tanh^{-1}(a(bz^c)^m)$ and $\tan^{-1}(iab^m z^{mc})$

01.27.27.0842.01

$$\tanh^{-1}(a(bz^c)^m) = -\frac{i(bz^c)^m}{b^m z^{mc}} \tan^{-1}(iab^m z^{mc}) ; 2m \in \mathbb{Z}$$

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

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\tan^{-1}(iz)$

01.27.27.0843.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = -2i \tan^{-1}(iz) ; |z| < 1$$

01.27.27.0844.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -2i \tan^{-1}(iz) - \pi i ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0845.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -2i \tan^{-1}(iz) + \pi i ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0846.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = -2i \tan^{-1}(iz) + \frac{\pi \sqrt{-z^2}}{z} ; |z| > 1$$

01.27.27.0847.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = \frac{\pi \sqrt{-z^2}}{2z} \left(\frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2 + 1} \right) - 2i \tan^{-1}(iz) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0848.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi i - 2i \tan^{-1}\left(\frac{i}{z}\right) ; |z| < 1 \wedge 0 \leq \arg(z) < \pi$$

01.27.27.0849.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -\pi i - 2i \tan^{-1}\left(\frac{i}{z}\right) ; |z| < 1 \wedge -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0850.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi \sqrt{-\frac{1}{z^2}} z - 2i \tan^{-1}\left(\frac{i}{z}\right); |z| < 1$$

01.27.27.0851.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -2i \tan^{-1}\left(\frac{i}{z}\right); |z| > 1$$

01.27.27.0852.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \frac{\pi}{2} \left(1 - \frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2}\right) \sqrt{-\frac{1}{z^2}} z - 2i \tan^{-1}\left(\frac{i}{z}\right); |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0853.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = -2i \tan^{-1}(iz) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0854.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = -2i \tan^{-1}(iz) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0855.01

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0856.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0857.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0858.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0859.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \tan^{-1}(\sqrt{z}) ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0860.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \tan^{-1}(\sqrt{z}) ; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0861.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}) ; |z| < 1$$

01.27.27.0862.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \tan^{-1}(\sqrt{z}) - \pi i ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0863.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \tan^{-1}(\sqrt{z}) + \pi i ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0864.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}) - \frac{\pi\sqrt{-z^2}}{z} ; |z| > 1$$

01.27.27.0865.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{z}}{2\sqrt{-z}} \left(\frac{z-1}{z+1} \sqrt{\left(\frac{1+z}{1-z}\right)^2 + 1} \right) + \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0866.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i ; |z| < 1 \wedge \text{Im}(z) > 0$$

01.27.27.0867.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i ; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0868.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0869.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \pi\sqrt{-z}\sqrt{\frac{1}{z}} - \frac{2\sqrt{-z}}{\sqrt{z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| < 1$$

01.27.27.0870.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0871.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0872.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| > 1$$

01.27.27.0873.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{-z}}{2}\left(\frac{1+z}{1-z}\sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1}\right)\sqrt{\frac{1}{z}} - \frac{2\sqrt{-z}}{\sqrt{z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| \neq 1$$

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

01.27.27.0874.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; |z| < 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.0875.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i; |z| < 1 \wedge \operatorname{Im}(z) \leq 0$$

01.27.27.0876.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \pi\sqrt{-z}\sqrt{\frac{1}{z}} - 2\sqrt{-z}\sqrt{\frac{1}{z}}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1$$

01.27.27.0877.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| > 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.0878.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| > 1 \wedge \operatorname{Im}(z) \leq 0$$

01.27.27.0879.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2\sqrt{-z}\sqrt{\frac{1}{z}}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| > 1$$

01.27.27.0880.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{-z}}{2} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) \sqrt{\frac{1}{z}} - 2\sqrt{-z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0881.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}(\sqrt{z}); |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0882.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}(\sqrt{z}); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0883.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}); |z| < 1$$

01.27.27.0884.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}(\sqrt{z}) + \pi i; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0885.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}(\sqrt{z}) - \pi i; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0886.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}) + \frac{\pi\sqrt{-z^2}}{z}; |z| > 1$$

01.27.27.0887.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi\sqrt{z}}{2\sqrt{-z}} \left(\frac{z-1}{z+1} \sqrt{\left(\frac{1+z}{1-z}\right)^2 + 1} \right) - \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}(\sqrt{z}); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0888.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i; |z| < 1 \wedge \text{Im}(z) > 0$$

01.27.27.0889.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0890.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0891.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\pi \sqrt{-z} \sqrt{\frac{1}{z}} + \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| < 1$$

01.27.27.0892.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.0893.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.0894.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| > 1$$

01.27.27.0895.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi \sqrt{-z}}{2} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) \sqrt{\frac{1}{z}} + \frac{2\sqrt{-z}}{\sqrt{z}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| \neq 1$$

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

01.27.27.0896.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; |z| < 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.0897.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; |z| < 1 \wedge \operatorname{Im}(z) \leq 0$$

01.27.27.0898.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\pi \sqrt{-z} \sqrt{\frac{1}{z}} + 2\sqrt{-z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| < 1$$

01.27.27.0899.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| > 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.0900.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| > 1 \wedge \text{Im}(z) \leq 0$$

01.27.27.0901.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2\sqrt{-z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| > 1$$

01.27.27.0902.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi\sqrt{-z}}{2} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) \sqrt{\frac{1}{z}} + 2\sqrt{-z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0903.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \tan^{-1}(\sqrt{z}) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.0904.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \tan^{-1}(\sqrt{z}) + \frac{\pi i}{2}; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0905.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \tan^{-1}(\sqrt{z}) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0906.01

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0907.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0908.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.0909.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0910.01

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0911.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} ; \operatorname{Im}(z) > 0$$

01.27.27.0912.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0913.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0914.01

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

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.27.27.0915.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \tan^{-1}(\sqrt{z}) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq 0$$

01.27.27.0916.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \tan^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0917.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \tan^{-1}(\sqrt{z}) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0918.01

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0919.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0920.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.0921.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0922.01

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0923.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.0924.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0925.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0926.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + cz\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + z\right)$ and $\tan^{-1}(iz)$

01.27.27.0927.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = -\frac{i}{2} \tan^{-1}(iz) + \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0928.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = -\frac{i}{2} \tan^{-1}(iz) - \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0929.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = -\frac{i}{2} \tan^{-1}(iz) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} + z\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0930.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{\pi i}{2} - \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0931.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0932.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = -\frac{\pi i}{2} - \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0933.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{\pi \sqrt{z - 1}}{4 \sqrt{1 - z} z} \left(z + \sqrt{z^2}\right) - \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right)$ and $\tan^{-1}(iz)$

01.27.27.0934.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{i}{2} \tan^{-1}(iz) + \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0935.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{i}{2} \tan^{-1}(iz) - \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0936.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{i}{2} \tan^{-1}(iz) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

Involving $\tanh^{-1}\left(\sqrt{1 + z^2} - z\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0937.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.0938.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{\pi i}{2} + \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0939.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=\frac{\pi i}{2}+\frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right);-\pi<\arg(z)\leq-\frac{\pi}{2}\vee(z\in\mathbb{R}\wedge-1<z<0)$$

01.27.27.0940.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=\frac{\pi\sqrt{-z-1}\left(z-\sqrt{z^2}\right)}{4\sqrt{z+1}z}+\frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right)$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0941.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=-\frac{i}{2}\tan^{-1}(iz)-\frac{\pi i}{4};0<\arg(z)\leq\frac{\pi}{2}\vee-\pi<\arg(z)\leq-\frac{\pi}{2}\vee(z\in\mathbb{R}\wedge-1<z<1)$$

01.27.27.0942.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=-\frac{i}{2}\tan^{-1}(iz)+\frac{\pi i}{4};\frac{\pi}{2}<\arg(z)<\pi\vee-\frac{\pi}{2}<\arg(z)<0\vee(z\in\mathbb{R}\wedge z<-1)\vee(z\in\mathbb{R}\wedge z>1)$$

01.27.27.0943.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=-\frac{i}{2}\tan^{-1}(iz)-\frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0944.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=-\frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right);-\frac{\pi}{2}<\arg(z)\leq\frac{\pi}{2}$$

01.27.27.0945.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=\frac{\pi i}{2}-\frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2}<\arg(z)<\pi\vee(z\in\mathbb{R}\wedge z<-1)$$

01.27.27.0946.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)=-\frac{\pi i}{2}-\frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right);-\pi<\arg(z)\leq-\frac{\pi}{2}\vee(z\in\mathbb{R}\wedge-1<z<0)$$

01.27.27.0947.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = -\frac{\pi\sqrt{-z-1}(z-\sqrt{z^2})}{4\sqrt{z+1}z} - \frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0948.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{i}{2}\tan^{-1}(iz) - \frac{\pi i}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.0949.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{i}{2}\tan^{-1}(iz) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0950.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{i}{2}\tan^{-1}(iz) - \frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0951.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi i}{2} + \frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0952.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.0953.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{\pi i}{2} + \frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0954.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi\sqrt{z-1}}{4\sqrt{1-z}z}(z+\sqrt{z^2}) + \frac{i}{2}\tan^{-1}\left(\frac{i}{z}\right)$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0955.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{\pi i}{2} - \frac{i}{2} \tan^{-1}(iz) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0956.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{\pi i}{2} - \frac{i}{2} \tan^{-1}(iz) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0957.01

$$\tanh^{-1}\left(\frac{1+\sqrt{1-z^2}}{z}\right) = -\frac{i}{2} \tan^{-1}(iz) - \frac{\pi z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0958.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0959.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0960.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\tan^{-1}(iz)$

01.27.27.0961.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0962.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0963.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0964.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2+1}}\right)$ and $\tan^{-1}(iz)$

01.27.27.0965.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2+1}}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0966.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2+1}}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0967.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2+1}}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0968.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2+1}}\right) = -\frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2-1}}\right)$ and $\tan^{-1}(iz)$

01.27.27.0969.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{\pi i}{2} + \frac{i}{2} \tan^{-1}(iz) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0970.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{\pi i}{2} + \frac{i}{2} \tan^{-1}(iz) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0971.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{i}{2} \tan^{-1}(iz) + \frac{\pi z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.27.27.0972.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0973.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0974.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{i}{2} \tan^{-1}\left(\frac{i}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving \cot^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\cot^{-1}(iz)$

01.27.27.0975.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + i \cot^{-1}(iz) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0976.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \cot^{-1}(iz) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0977.01

$$\tanh^{-1}(z) = i \cot^{-1}(iz) - \frac{\pi \sqrt{-z^2}}{2z} \sqrt{\frac{z^2}{z^2-1}} \sqrt{\frac{z^2-1}{z^2}}$$

Involving $\tanh^{-1}(z)$ and $\cot^{-1}(-iz)$

01.27.27.0978.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \cot^{-1}(-iz) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0979.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \cot^{-1}(-iz) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0980.01

$$\tanh^{-1}(z) = -i \cot^{-1}(-iz) - \frac{\pi \sqrt{-z^2}}{2z} \sqrt{\frac{z^2}{z^2-1}} \sqrt{\frac{z^2-1}{z^2}}$$

Involving $\tanh^{-1}(z)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.0019.01

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

Involving $\tanh^{-1}(z)$ and $\cot^{-1}\left(-\frac{i}{z}\right)$

01.27.27.0981.01

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

Involving $\tanh^{-1}(iz)$

Involving $\tanh^{-1}(iz)$ and $\cot^{-1}(z)$

01.27.27.0982.01

$$\tanh^{-1}(iz) = \frac{\pi i}{2} - i \cot^{-1}(z) ; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.0983.01

$$\tanh^{-1}(iz) = -\frac{\pi i}{2} - i \cot^{-1}(z) ; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.0984.01

$$\tanh^{-1}(iz) = \frac{\pi i}{2z} \sqrt{z^2} \sqrt{\frac{z^2}{z^2+1}} \sqrt{\frac{z^2+1}{z^2}} - i \cot^{-1}(z)$$

Involving $\tanh^{-1}(iz)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.27.27.0985.01

$$\tanh^{-1}(iz) = i \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\cot^{-1}(iz)$

01.27.27.0986.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = i \cot^{-1}(iz)$$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.0987.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = -\frac{\pi i}{2} + i \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0988.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \frac{\pi i}{2} + i \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0989.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = i \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi \sqrt{-z^2}}{2z}; z \notin (-1, 1)$$

01.27.27.0990.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = i \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \operatorname{sgn}(\operatorname{Im}(z)); \operatorname{Im}(z) \neq 0$$

01.27.27.0991.01

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

Involving $\tanh^{-1}(\sqrt{-z})$

Involving $\tanh^{-1}(\sqrt{-z})$ and $\cot^{-1}(\sqrt{z})$

01.27.27.0992.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} + i \cot^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0993.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} - i \cot^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.27.27.0994.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} + i \cot^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0995.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi \sqrt{-z-1}}{2\sqrt{z+1}} - \frac{\sqrt{-z}}{\sqrt{z}} \cot^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}(\sqrt{-z})$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.0996.01

$$\tanh^{-1}(\sqrt{-z}) = -i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.0997.01

$$\tanh^{-1}(\sqrt{-z}) = i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.0998.01

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

Involving $\tanh^{-1}(\sqrt{-z})$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.0999.01

$$\tanh^{-1}(\sqrt{-z}) = -i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1000.01

$$\tanh^{-1}(\sqrt{-z}) = i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.27.27.1001.01

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

Involving $\tanh^{-1}(\sqrt{-z})$ and $\cot^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.27.1002.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} + i \cot^{-1}\left(1/\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1003.01

$$\tanh^{-1}(\sqrt{-z}) = \frac{\pi i}{2} - i \cot^{-1}\left(1/\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1004.01

$$\tanh^{-1}(\sqrt{-z}) = -\frac{\pi i}{2} - i \cot^{-1}\left(1/\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1005.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.27.27.1006.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \cot^{-1}(\sqrt{z}); 0 < \arg(z) \leq \pi$$

01.27.27.1007.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \cot^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.27.27.1008.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1009.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1010.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.1011.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1012.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1013.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.1014.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1015.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1016.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(1 / \sqrt{\frac{1}{z}}\right)$

01.27.27.1017.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \cot^{-1}\left(1 / \sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.1018.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \cot^{-1}\left(1 / \sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \leq 0$$

01.27.27.1019.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$ and $\cot^{-1}(i z)$

01.27.27.1020.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} + i \cot^{-1}(i z) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1021.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} + i \cot^{-1}(i z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1022.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} - i \cot^{-1}(i z) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1023.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} - i \cot^{-1}(i z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1024.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1025.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = i \cot^{-1}\left(\frac{i}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1026.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -i \cot^{-1}\left(\frac{i}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1027.01

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

Involving $\tanh^{-1}\left(a(b z^c)^m\right)$

Involving $\tanh^{-1}\left(a(b z^c)^m\right)$ and $\cot^{-1}\left(\frac{i}{a} b^{-m} z^{-m c}\right)$

01.27.27.1028.01

$$\tanh^{-1}\left(a(b z^c)^m\right) = \frac{i(b z^c)^m}{b^m z^{m c}} \cot^{-1}\left(\frac{i}{a} b^{-m} z^{-m c}\right) /; 2 m \in \mathbb{Z}$$

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

Involving $\tanh^{-1}\left(\frac{2 z}{1+z^2}\right)$ and $\cot^{-1}(i z)$

01.27.27.1029.01

$$\tanh^{-1}\left(\frac{2 z}{z^2 + 1}\right) = \pi i + 2 i \cot^{-1}(i z) /; |z| < 1 \wedge 0 \leq \arg(z) < \pi$$

01.27.27.1030.01

$$\tanh^{-1}\left(\frac{2 z}{z^2 + 1}\right) = -\pi i + 2 i \cot^{-1}(i z) /; |z| < 1 \wedge -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1031.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi \sqrt{-\frac{1}{z^2}} z + 2i \cot^{-1}(iz) ; |z| < 1$$

01.27.27.1032.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2i \cot^{-1}(iz) ; |z| > 1$$

01.27.27.1033.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \frac{\pi}{2} \left(1 - \frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2} \right) \sqrt{-\frac{1}{z^2}} z + 2i \cot^{-1}(iz) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1034.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) ; |z| < 1$$

01.27.27.1035.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) - \pi i ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1036.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) + \pi i ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1037.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi \sqrt{-z^2}}{z} ; |z| > 1$$

01.27.27.1038.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = \frac{\pi \sqrt{-z^2}}{2z} \left(\frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2} + 1 \right) + 2i \cot^{-1}\left(\frac{i}{z}\right) ; |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\cot^{-1}(iz)$

01.27.27.1039.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \cot^{-1}(iz) + \frac{\pi i}{2} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1040.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \cot^{-1}(iz) - \frac{\pi i}{2} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1041.01

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1042.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1043.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2i \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1044.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$ and $\cot^{-1}(\sqrt{z})$

01.27.27.1045.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}(\sqrt{z}) - \pi i ; |z| < 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.1046.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}(\sqrt{z}) + \pi i ; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1047.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}(\sqrt{z}) + \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1048.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \pi \sqrt{-z} \sqrt{\frac{1}{z}} - \frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}(\sqrt{z}) ; |z| < 1$$

01.27.27.1049.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}(\sqrt{z}) ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1050.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}(\sqrt{z}) /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1051.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}(\sqrt{z}) /; |z| > 1$$

01.27.27.1052.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{-z}}{2} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) \sqrt{\frac{1}{z}} - \frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}(\sqrt{z}) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1053.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1054.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1055.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| < 1$$

01.27.27.1056.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1057.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1058.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi\sqrt{-z^2}}{z} /; |z| > 1$$

01.27.27.1059.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{z}}{2\sqrt{-z}} \left(\frac{z-1}{z+1} \sqrt{\left(\frac{1+z}{1-z}\right)^2 + 1} \right) + \frac{2\sqrt{-z}}{\sqrt{z}} \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1060.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| < 1 \wedge \text{Im}(z) > 0$$

01.27.27.1061.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| < 1 \wedge \text{Im}(z) \leq 0$$

01.27.27.1062.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2\sqrt{-z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| < 1$$

01.27.27.1063.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1064.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = -2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; |z| > 1 \wedge \text{Im}(z) > 0$$

01.27.27.1065.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = 2\sqrt{-z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi\sqrt{-z^2}}{z} /; |z| > 1$$

01.27.27.1066.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) = \frac{\pi\sqrt{z}}{2\sqrt{-z}} \left(\frac{z-1}{z+1} \sqrt{\left(\frac{1+z}{1-z}\right)^2 + 1} \right) + 2\sqrt{-z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$ and $\cot^{-1}(\sqrt{z})$

01.27.27.1067.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \cot^{-1}(\sqrt{z}) + \pi i /; |z| < 1 \wedge \text{Im}(z) > 0$$

01.27.27.1068.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i \cot^{-1}(\sqrt{z}) - \pi i /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1069.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i \cot^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1070.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\pi\sqrt{-z}\sqrt{\frac{1}{z}} + \frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}(\sqrt{z}) ; |z| < 1$$

01.27.27.1071.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i\cot^{-1}(\sqrt{z}) ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1072.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i\cot^{-1}(\sqrt{z}) ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1073.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = \frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}(\sqrt{z}) ; |z| > 1$$

01.27.27.1074.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi\sqrt{-z}}{2}\left(\frac{1+z}{1-z}\sqrt{\left(\frac{1-z}{1+z}\right)^2} + 1\right)\sqrt{\frac{1}{z}} + \frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}(\sqrt{z}) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1075.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1076.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) ; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1077.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) ; |z| < 1$$

01.27.27.1078.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1079.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1080.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{-z^2}}{z} ; |z| > 1$$

01.27.27.1081.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi\sqrt{z}}{2\sqrt{-z}}\left(\frac{z-1}{z+1}\sqrt{\left(\frac{1+z}{1-z}\right)^2+1}\right) - \frac{2\sqrt{-z}}{\sqrt{z}}\cot^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1082.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1 \wedge \text{Im}(z) > 0$$

01.27.27.1083.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1 \wedge \text{Im}(z) \leq 0$$

01.27.27.1084.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2\sqrt{-z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1$$

01.27.27.1085.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1086.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = 2i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; |z| > 1 \wedge \text{Im}(z) > 0$$

01.27.27.1087.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -2\sqrt{-z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\sqrt{-z^2}}{z}; |z| > 1$$

01.27.27.1088.01

$$\tanh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) = -\frac{\pi\sqrt{z}}{2\sqrt{-z}}\left(\frac{z-1}{z+1}\sqrt{\left(\frac{1+z}{1-z}\right)^2+1}\right) - 2\sqrt{-z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.27.27.1089.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i\cot^{-1}(\sqrt{z}) - \frac{\pi i}{2}; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1090.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \cot^{-1}(\sqrt{z}) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1091.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \cot^{-1}(\sqrt{z}) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1092.01

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1093.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1094.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1095.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1096.01

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

Involving $\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1097.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1098.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.1099.01

$$\tanh^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1100.01

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

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.27.27.1101.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \cot^{-1}(\sqrt{z}) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1102.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \cot^{-1}(\sqrt{z}) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1103.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \cot^{-1}(\sqrt{z}) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1104.01

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1105.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1106.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1107.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1108.01

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

Involving $\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1109.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = 2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \quad ; \operatorname{Im}(z) > 0$$

01.27.27.1110.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.1111.01

$$\tanh^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) = -2i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1112.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + cz\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + z\right)$ and $\cot^{-1}(iz)$

01.27.27.1113.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{\pi i}{2} + \frac{i}{2} \cot^{-1}(iz) \quad ; 0 < \arg(z) \leq \frac{\pi}{2} \quad \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1114.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{i}{2} \cot^{-1}(iz) \quad ; \frac{\pi}{2} < \arg(z) \leq \pi \quad \vee \quad -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1115.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = -\frac{\pi i}{2} + \frac{i}{2} \cot^{-1}(iz) \quad ; -\frac{\pi}{2} < \arg(z) < 0 \quad \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1116.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{\pi\sqrt{z-1}}{4\sqrt{1-z}z} \left(z + \sqrt{z^2}\right) + \frac{i}{2} \cot^{-1}(iz)$$

Involving $\tanh^{-1}\left(\sqrt{z^2-1} + z\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1117.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} \quad ; 0 < \arg(z) \leq \frac{\pi}{2} \quad \vee \quad -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1118.01

$$\tanh^{-1}\left(z + \sqrt{z^2-1}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} \quad ; \frac{\pi}{2} < \arg(z) < \pi \quad \vee \quad -\frac{\pi}{2} < \arg(z) < 0 \quad \vee (z \in \mathbb{R} \wedge z < -1) \quad \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1119.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

Involving $\tanh^{-1}\left(\sqrt{1 + z^2} - z\right)$ and $\cot^{-1}(iz)$

01.27.27.1120.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{i}{2} \cot^{-1}(iz) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1121.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{\pi i}{2} - \frac{i}{2} \cot^{-1}(iz) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1122.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{\pi i}{2} - \frac{i}{2} \cot^{-1}(iz) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1123.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = \frac{\pi \sqrt{-z - 1} (z - \sqrt{z^2})}{4 \sqrt{z + 1} z} - \frac{i}{2} \cot^{-1}(iz)$$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1124.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1125.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1126.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2 - 1} + z}\right)$ and $\cot^{-1}(iz)$

01.27.27.1127.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{i}{2} \cot^{-1}(iz) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1128.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{\pi i}{2} + \frac{i}{2} \cot^{-1}(iz) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1129.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = -\frac{\pi i}{2} + \frac{i}{2} \cot^{-1}(iz) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1130.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = -\frac{\pi \sqrt{-z-1} (z - \sqrt{z^2})}{4 \sqrt{z+1} z} + \frac{i}{2} \cot^{-1}(iz)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1131.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1132.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1133.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi \sqrt{z^2-1}}{4 \sqrt{1-z^2}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\cot^{-1}(iz)$

01.27.27.1134.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi i}{2} - \frac{i}{2} \cot^{-1}(iz) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1135.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{i}{2} \cot^{-1}(iz) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1136.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{\pi i}{2} - \frac{i}{2} \cot^{-1}(iz) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1137.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi \sqrt{z-1}}{4 \sqrt{1-z} z} (z + \sqrt{z^2}) - \frac{i}{2} \cot^{-1}(iz)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1138.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1139.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1140.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi \sqrt{z^2-1}}{4 \sqrt{1-z^2}}$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\cot^{-1}(iz)$

01.27.27.1141.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{i}{2} \cot^{-1}(iz) - \frac{\pi i}{4} /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1142.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{i}{2} \cot^{-1}(iz) + \frac{\pi i}{4} /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1143.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{i}{2} \cot^{-1}(iz) - \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1144.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{\pi i}{2} + \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1145.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{\pi i}{2} + \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1146.01

$$\tanh^{-1}\left(\frac{1+\sqrt{1-z^2}}{z}\right) = \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\cot^{-1}(iz)$

01.27.27.1147.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{i}{2} \cot^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1148.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{i}{2} \cot^{-1}(iz) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1149.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{i}{2} \cot^{-1}(iz) - \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1150.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right)$ and $\cot^{-1}(iz)$

01.27.27.1151.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{i}{2} \cot^{-1}(iz) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1152.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{i}{2} \cot^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1153.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{i}{2} \cot^{-1}(iz) + \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1154.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right)$ and $\cot^{-1}(iz)$

01.27.27.1155.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{i}{2} \cot^{-1}(iz) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1156.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{i}{2} \cot^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1157.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{i}{2} \cot^{-1}(iz) + \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.27.27.1158.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{\pi i}{2} - \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1159.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{\pi i}{2} - \frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1160.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{i}{2} \cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}}$$

Involving \csc^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right)$

01.27.27.1161.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{i}{2} \csc^{-1}\left(\frac{1-z^2}{1+z^2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1162.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} i \csc^{-1}\left(\frac{1-z^2}{1+z^2}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1163.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} i \csc^{-1}\left(\frac{1-z^2}{1+z^2}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1164.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} i \csc^{-1}\left(\frac{1-z^2}{1+z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1165.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \frac{i\sqrt{-z^2}}{z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + \frac{\sqrt{-z^2} \sqrt{1-z^2}}{2z} \sqrt{\frac{1}{1-z^2}} \csc^{-1}\left(\frac{1-z^2}{1+z^2}\right)$$

Involving $\tanh^{-1}(z)$ and $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$

01.27.27.1166.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{i}{2} \csc^{-1}\left(\frac{z^2-1}{z^2+1}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1167.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \operatorname{csc}^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1168.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2} i \operatorname{csc}^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1169.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2} i \operatorname{csc}^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1170.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\sqrt{1-z^2}\right)$

01.27.27.1171.01

$$\tanh^{-1}(z) = i \operatorname{csc}^{-1}\left(\sqrt{1-z^2}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1172.01

$$\tanh^{-1}(z) = -i \operatorname{csc}^{-1}\left(\sqrt{1-z^2}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1173.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

01.27.27.1174.01

$$\tanh^{-1}(z) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1175.01

$$\tanh^{-1}(z) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1176.01

$$\tanh^{-1}(z) = -\pi i + i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1177.01

$$\tanh^{-1}(z) = \pi i + i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1178.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

01.27.27.1179.01

$$\tanh^{-1}(z) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1180.01

$$\tanh^{-1}(z) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1181.01

$$\tanh^{-1}(z) = -\pi i + i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1182.01

$$\tanh^{-1}(z) = \pi i - i \operatorname{csc}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1183.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

01.27.27.1184.01

$$\tanh^{-1}(z) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1185.01

$$\tanh^{-1}(z) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1186.01

$$\tanh^{-1}(z) = -\pi i + i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1187.01

$$\tanh^{-1}(z) = \pi i - i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1188.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

01.27.27.1189.01

$$\tanh^{-1}(z) = i \operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1190.01

$$\tanh^{-1}(z) = -i \operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1191.01

$$\tanh^{-1}(z) = -\pi i + i \operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1192.01

$$\tanh^{-1}(z) = \pi i - i \operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1193.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1}\left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2} + 1}\right)$

01.27.27.1194.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}} \right) + \pi i ; 0 < \arg(z) \leq \pi$$

01.27.27.1195.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}} \right) - \pi i ; -\pi < \arg(z) \leq 0$$

01.27.27.1196.01

$$\tanh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(-\pi + 2 \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}} \right) \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2} - 1} \right)$

01.27.27.1197.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} - 1}} \right) ; 0 < \arg(z) \leq \pi$$

01.27.27.1198.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} - 1}} \right) ; -\pi < \arg(z) \leq 0$$

01.27.27.1199.01

$$\tanh^{-1}(z) = -\frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} - 1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{1-z^2}} / (\sqrt{1-z^2} + 1) \right)$

01.27.27.1200.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) - \pi i ; -\pi < \arg(z) \leq 0$$

01.27.27.1201.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) + \pi i ; 0 < \arg(z) \leq \pi$$

01.27.27.1202.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{1-z^2}} / (\sqrt{1-z^2} - 1) \right)$

01.27.27.1203.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} - 1}} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1204.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} - 1}} \right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1205.01

$$\tanh^{-1}(z) = \frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}} \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} - 1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2} (z^2 - 1)^{1/4} / \sqrt{\sqrt{z^2 - 1} + z} \right)$

01.27.27.1206.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1207.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1208.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1209.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1210.01

$$\tanh^{-1}(z) = 2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} \left(1 - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \sqrt{1-z} \sqrt{\frac{1}{1-z}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right)$

01.27.27.1211.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1212.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1213.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1214.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1215.01

$$\tanh^{-1}(z) = -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \frac{\pi i}{2} \left(1 - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{z^2 - 1}} / (\sqrt{z^2 - 1} + z) \right)$

01.27.27.1216.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1217.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1218.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1219.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{z^2 - 1}} / (\sqrt{z^2 - 1} - z) \right)$

01.27.27.1220.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2 - 1}}{\sqrt{z^2 - 1} - z}} \right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1221.01

$$\tanh^{-1}(z) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1222.01

$$\tanh^{-1}(z) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) + \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1223.01

$$\begin{aligned} \tanh^{-1}(z) = & -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) + \\ & \frac{\pi i}{2} \left(1-i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \right) \end{aligned}$$

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.1224.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1} \left(\frac{1-z}{1+z} \right) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi$$

01.27.27.1225.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1} \left(\frac{1-z}{1+z} \right) - \frac{\pi i}{4} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1226.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1} \left(\frac{1-z}{1+z} \right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1227.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) + \frac{\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \operatorname{csc}^{-1} \left(\frac{1-z}{1+z} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.1228.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1} \left(\frac{z-1}{z+1} \right) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi$$

01.27.27.1229.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1} \left(\frac{z-1}{z+1} \right) - \frac{\pi i}{4} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1230.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{z+1}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1231.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) - \frac{\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \operatorname{csc}^{-1}\left(\frac{z-1}{z+1}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.1232.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right); |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1233.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1234.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right); |z| < 1$$

01.27.27.1235.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) + \frac{\pi i}{2}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1236.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{2}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1237.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi \sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.1238.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi \sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \right) - \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csc}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.1239.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1240.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1241.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1$$

01.27.27.1242.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{\pi i}{2}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1243.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{2}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1244.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi\sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.1245.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2}\right) + \frac{\sqrt{-z^2}(1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}(\sqrt{1-z})$

01.27.27.1246.01

$$\tanh^{-1}(\sqrt{z}) = -i \operatorname{csc}^{-1}(\sqrt{1-z}) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1247.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1}(\sqrt{1-z}) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1248.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{z} \operatorname{csc}^{-1}(\sqrt{1-z}) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.1249.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1250.01

$$\tanh^{-1}(\sqrt{z}) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.1251.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1252.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-z}} \right)$

01.27.27.1253.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-z}} \right); 0 < \arg(z) \leq \pi$$

01.27.27.1254.01

$$\tanh^{-1}(\sqrt{z}) = -i \operatorname{csc}^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-z}} \right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1255.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-z}} \right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1256.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1} \left(\sqrt{\frac{z-1}{z}} \right)$

01.27.27.1257.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1} \left(\sqrt{\frac{z-1}{z}} \right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1258.01

$$\tanh^{-1}(\sqrt{z}) = -i \operatorname{csc}^{-1} \left(\sqrt{\frac{z-1}{z}} \right); \operatorname{Im}(z) < 0$$

01.27.27.1259.01

$$\tanh^{-1}(\sqrt{z}) = i \operatorname{csc}^{-1} \left(\sqrt{\frac{z-1}{z}} \right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1260.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1} \left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1} \right)$

01.27.27.1261.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) + \pi i /; 0 < \arg(z) \leq \pi$$

01.27.27.1262.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.1263.01

$$\tanh^{-1}(\sqrt{z}) = \frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) - \frac{\pi\sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\sqrt{2}(1-z)^{1/4} / \sqrt{\sqrt{1-z}-1}\right)$

01.27.27.1264.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) /; 0 < \arg(z) \leq \pi$$

01.27.27.1265.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) /; -\pi < \arg(z) \leq 0$$

01.27.27.1266.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1}\left(\sqrt{2\sqrt{1-z}} / (\sqrt{1-z}+1)\right)$

01.27.27.1267.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) + \pi i /; 0 < \arg(z) \leq \pi$$

01.27.27.1268.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.1269.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\csc^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-1)}\right)$

01.27.27.1270.01

$$\tanh^{-1}(\sqrt{z}) = 2i \csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1271.01

$$\tanh^{-1}(\sqrt{z}) = -2i \csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1272.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\csc^{-1}\left(\sqrt{2(1-z)^{1/4}/\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right)$

01.27.27.1273.01

$$\tanh^{-1}(\sqrt{z}) = 2i \csc^{-1}\left(\frac{\sqrt{2(1-z)^{1/4}}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1274.01

$$\tanh^{-1}(\sqrt{z}) = -2i \csc^{-1}\left(\frac{\sqrt{2(1-z)^{1/4}}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1275.01

$$\tanh^{-1}(\sqrt{z}) = 2i \csc^{-1}\left(\frac{\sqrt{2(1-z)^{1/4}}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1276.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi\sqrt{-z^2}}{z} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right) - \frac{2\sqrt{-z^2}\sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \csc^{-1}\left(\frac{\sqrt{2(1-z)^{1/4}}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\csc^{-1}\left(\sqrt{2(1-z)^{1/4}/\sqrt{\sqrt{1-z}-\sqrt{-z}}}\right)$

01.27.27.1277.01

$$\tanh^{-1}(\sqrt{z}) = -2i \csc^{-1}\left(\frac{\sqrt{2(1-z)^{1/4}}}{\sqrt{\sqrt{1-z}-\sqrt{-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1278.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}} \right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1279.01

$$\tanh^{-1}(\sqrt{z}) = \frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}} \right) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{1-z} / (\sqrt{1-z} + \sqrt{-z})} \right)$

01.27.27.1280.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}} \right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1281.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}} \right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1282.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}} \right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1283.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csc}^{-1} \left(\sqrt{2\sqrt{1-z} / (\sqrt{1-z} - \sqrt{-z})} \right)$

01.27.27.1284.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - \sqrt{-z}}} \right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1285.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - \sqrt{-z}}} \right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1286.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.1287.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1-z}{1+z}\right) - \frac{\pi i}{4}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1288.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{1-z}{1+z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0$$

01.27.27.1289.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{1-z}{1+z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1290.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i \sqrt{z} \sqrt{-\frac{1}{z} - 1} \right) + \frac{\sqrt{1-z} \sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \csc^{-1}\left(\frac{1-z}{1+z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.1291.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{z-1}{z+1}\right) - \frac{\pi i}{4}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1292.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{z-1}{z+1}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0$$

01.27.27.1293.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{z-1}{z+1}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1294.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i \sqrt{z} \sqrt{-\frac{1}{z} - 1} \right) - \frac{\sqrt{1-z} \sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \csc^{-1}\left(\frac{z-1}{z+1}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.1295.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{2}; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1296.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) + \frac{\pi i}{2} ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.1297.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1298.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{2z} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi\sqrt{z}}{2} \sqrt{-\frac{1}{z}} ; |z| < 1$$

01.27.27.1299.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1300.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1301.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) ; |z| > 1$$

01.27.27.1302.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) - \frac{\sqrt{-z^2}(1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \csc^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.1303.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \csc^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{2} ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1304.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{\pi i}{2} ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.1305.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1306.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \csc^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi\sqrt{z}}{2} \sqrt{-\frac{1}{z}} ; |z| < 1$$

01.27.27.1307.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1308.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1309.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{2z} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| > 1$$

01.27.27.1310.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} + 1 \right) + \frac{\sqrt{-z^2}(1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csc}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}(\sqrt{1-z})$

01.27.27.1311.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csc}^{-1}(\sqrt{1-z}); 0 < \arg(z) \leq \pi$$

01.27.27.1312.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csc}^{-1}(\sqrt{1-z}); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1313.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csc}^{-1}(\sqrt{1-z}) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1314.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.1315.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.1316.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.1317.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

01.27.27.1318.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1319.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.1320.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csc}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1321.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

01.27.27.1322.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csc}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) \geq 0$$

01.27.27.1323.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csc}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.1324.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1}\right)$

01.27.27.1325.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.1326.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1327.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1328.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+1}}\right) - \pi \left(\frac{\sqrt{z-1}}{2\sqrt{1-z}} + \frac{\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right)$

01.27.27.1329.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1330.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1331.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1332.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{2\sqrt{-z^2}}{z} \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right)$

01.27.27.1333.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1334.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1335.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1336.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-1)}\right)$

01.27.27.1337.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1338.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1339.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{2(1-z)^{1/4}/\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right)$

01.27.27.1340.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1341.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right) + \pi i; \operatorname{Im}(z) < 0$$

01.27.27.1342.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1343.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + 2i\sqrt{z} \sqrt{-\frac{1}{z}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) - \frac{2\sqrt{-z^2}\sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}+\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - \sqrt{-z}}\right)$

01.27.27.1344.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \csc^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1345.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \csc^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1346.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \csc^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1347.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1 \right) + \frac{2\sqrt{-z^2}}{z} \csc^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} + \sqrt{-z})\right)$

01.27.27.1348.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1349.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) + \pi i; \operatorname{Im}(z) < 0$$

01.27.27.1350.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1351.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} - \sqrt{-z})\right)$

01.27.27.1352.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1353.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1354.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1355.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\operatorname{csc}^{-1}(\sqrt{z})$

01.27.27.1356.01

$$\tanh^{-1}(\sqrt{1-z}) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}(\sqrt{z}); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1357.01

$$\tanh^{-1}(\sqrt{1-z}) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}(\sqrt{z}); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1358.01

$$\tanh^{-1}(\sqrt{1-z}) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{csc}^{-1}(\sqrt{z}) - \frac{\pi \sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\operatorname{csc}^{-1}(\sqrt{z})$

01.27.27.1359.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \operatorname{csc}^{-1}(\sqrt{z}); 0 < \arg(z) \leq \pi$$

01.27.27.1360.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \operatorname{csc}^{-1}(\sqrt{z}); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1361.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \csc^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0020.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\csc^{-1}(\sqrt{z})$

01.27.27.1362.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \csc^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1363.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \csc^{-1}(\sqrt{z}) /; \text{Im}(z) < 0$$

01.27.27.1364.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \csc^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1365.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1366.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1367.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.1368.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.1369.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + i \sqrt{-z} \sqrt{\frac{1}{z}} - \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}}\right) - \frac{\sqrt{-1+z}}{\sqrt{1-z}} \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

$$\text{01.27.27.1370.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - \frac{i \sqrt{z-1}}{\sqrt{1-z}} - 1\right) - \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

$$\text{01.27.27.1371.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.1372.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.1373.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + i \sqrt{-z} \sqrt{\frac{1}{z}} - \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}}\right) - \frac{\sqrt{z-1}}{\sqrt{1-z}} \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

$$\text{01.27.27.1374.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - \frac{i \sqrt{z-1}}{\sqrt{1-z}} - 1\right) - \frac{\sqrt{z-1}}{\sqrt{1-z}} \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

$$\text{01.27.27.1375.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0$$

$$\text{01.27.27.1376.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.1377.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1378.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1379.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1380.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.27.27.1381.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1382.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1383.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1384.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1385.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1386.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi i}{2} - i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1387.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\frac{\pi i}{2} + i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1388.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1389.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1390.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.1391.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1392.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1393.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1394.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1395.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1396.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1397.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1398.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1399.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1400.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1401.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1402.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

$$\text{01.27.27.1403.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.1404.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \sqrt{\frac{1}{z}} \sqrt{-z} \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

$$\text{01.27.27.1405.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi$$

$$\text{01.27.27.1406.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.1407.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.1408.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\sqrt{-z^2}}{z} \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

$$\text{01.27.27.1409.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \text{Im}(z) > 0$$

$$\text{01.27.27.1410.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

$$\text{01.27.27.1411.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1412.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1413.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1414.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} ; \text{Im}(z) < 0$$

01.27.27.1415.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1416.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1417.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1418.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1419.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1420.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1421.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1422.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1423.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1424.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1425.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0$$

01.27.27.1426.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.1427.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1428.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{4} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + i \sqrt{-z} \sqrt{\frac{1}{z} - 1} \right) + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \csc^{-1}\left(\frac{1}{z}\right)$$

01.27.27.1429.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1430.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1431.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1432.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1433.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1434.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1435.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} i \csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1436.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \csc^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1437.01

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

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$ and $\csc^{-1}(z)$

01.27.27.1438.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \csc^{-1}(z) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1439.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \csc^{-1}(z) + \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1440.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \csc^{-1}(z) + \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1441.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \csc^{-1}(z) - \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1442.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \frac{z\sqrt{z^2-1}}{\sqrt{z^2-z^4}} \csc^{-1}(z) + \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}$$

01.27.27.0021.01

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

01.27.27.0022.01

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

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.27.27.1443.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \csc^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1444.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \csc^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1445.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \csc^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1446.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \csc^{-1}(z) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0023.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -\frac{\sqrt{-z^2}}{z} \csc^{-1}(z) /; z \notin (-1, 1)$$

01.27.27.0024.02

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.27.27.1447.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \csc^{-1}(z) /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1448.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \csc^{-1}(z) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1449.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \csc^{-1}(z) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1450.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \csc^{-1}(z) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1451.01

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

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

Involving $\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\csc^{-1}(z)$

01.27.27.1452.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1453.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.1454.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.1455.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + i \csc^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1456.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1457.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \csc^{-1}\left(\frac{1}{z}\right) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1458.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \csc^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1459.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \csc^{-1}\left(\frac{1}{z}\right) + \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1460.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1461.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \operatorname{csc}^{-1}\left(\frac{1}{z}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.1462.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{z}\right)$

01.27.27.1463.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1464.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1465.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1466.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1467.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} \left(\sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} - 1 \right) + \frac{\sqrt{z^2-z^4}}{z \sqrt{z^2-1}} \operatorname{csc}^{-1}\left(\frac{1}{z}\right)$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1468.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \csc^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1469.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \csc^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1470.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \csc^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1471.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \csc^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1472.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1473.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \csc^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1474.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \csc^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1475.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\pi i - i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1476.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \operatorname{csc}^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1477.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{z}\right)$

01.27.27.1478.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.1479.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1480.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1481.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.1482.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1483.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1484.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1485.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi \quad (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1486.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + i \csc^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1487.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1488.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.1489.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.1490.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.1491.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.1492.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\operatorname{csc}^{-1}\left(\frac{1}{z}\right)$

01.27.27.1493.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1494.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1495.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1496.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi i}{2} + i \operatorname{csc}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1497.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2}+1}{z}\right)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.27.27.1498.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = -\frac{\pi i}{2} + \frac{1}{2}i \csc^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.1499.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = \frac{\pi i}{2} + \frac{1}{2}i \csc^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1500.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2}-1}{z}\right)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.27.27.1501.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}+1}\right)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.27.27.1502.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right)$ and $\csc^{-1}\left(\frac{i}{z}\right)$

01.27.27.1503.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{\pi i}{2} + \frac{1}{2}i \csc^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.1504.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{2} + \frac{1}{2} i \operatorname{csc}^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1505.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$ and $\operatorname{csc}^{-1}(z)$

01.27.27.1506.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2i \operatorname{csc}^{-1}(z); |z| > \sqrt{2} \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1507.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = 2i \operatorname{csc}^{-1}(z); |z| > \sqrt{2} \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1508.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\pi \left(\theta \left(\left| \sqrt{z^2-1} \right| - 1 \right) - 1 \right) + \frac{2\sqrt{z^2}}{z} \operatorname{csc}^{-1}(z) \right)$$

01.27.27.1509.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \right. \right. \\ & \left. \left. \sqrt{\frac{i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \operatorname{csc}^{-1}(z) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.27.27.1510.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - 2i \csc^{-1}(z) \ ; \ 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1511.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + 2i \csc^{-1}(z) \ ; \ -\frac{\pi}{2} < \arg(z) < 0 \ \vee \ (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1512.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - 2i \csc^{-1}(z) \ ; \ \frac{\pi}{2} < \arg(z) < \pi \ \vee \ (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1513.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + 2i \csc^{-1}(z) \ ; \ -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1514.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1515.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = 2i \csc^{-1}\left(\frac{1}{z}\right) \ ; \ \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2} \ \vee \ -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1516.01

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

$$\left. \frac{\pi}{2} \left(\frac{\sqrt{z^2-1} z}{\sqrt{z^4-z^2}} + \sqrt{\frac{1}{z}} \sqrt{\frac{1}{\sqrt{2} z-1}} \sqrt{\sqrt{2} z-1} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\sqrt{2} z-1} \sqrt{-\frac{1}{\sqrt{2} z+1}} + \frac{\sqrt{z^2}}{z} \right) \right)$$

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

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.27.27.1517.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + 2i \csc^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (iz \in \mathbb{R} \wedge iz > 0)$$

01.27.27.1518.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2i \csc^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1519.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - 2i \csc^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.1520.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2i \csc^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (iz \in \mathbb{R} \wedge iz < 0)$$

01.27.27.1521.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2i \csc^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1522.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} - 2i \csc^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1523.01

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

Involving \sec^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{i(1-z^2)}{2z}\right)$

01.27.27.1524.01

$$\tanh^{-1}(z) = \frac{i}{2} \left(\frac{\pi}{2} - \sec^{-1} \left(\frac{i(1-z^2)}{2z} \right) \right) /; |z| < 1$$

01.27.27.1525.01

$$\tanh^{-1}(z) = \frac{1}{2} i \sec^{-1} \left(\frac{i(1-z^2)}{2z} \right) + \frac{\pi i}{4} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1526.01

$$\tanh^{-1}(z) = \frac{1}{2} i \sec^{-1} \left(\frac{i(1-z^2)}{2z} \right) - \frac{3\pi i}{4} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1527.01

$$\tanh^{-1}(z) = \frac{1}{2} i \sec^{-1} \left(\frac{i(1-z^2)}{2z} \right) - \frac{1}{2} \pi \left(\frac{\sqrt{-z^2}}{z} + \frac{i}{2} \right) /; |z| > 1$$

01.27.27.1528.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(-\frac{\sqrt{-z^2}}{z} + \left(\frac{\sqrt{-z^2}}{z} + i \right) \frac{1-z}{1+z} \sqrt{\left(\frac{1+z}{-1+z} \right)^2} \right) - \frac{i(1-z)}{2(1+z)} \sqrt{\left(\frac{z+1}{z-1} \right)^2} \sec^{-1} \left(\frac{i(1-z^2)}{2z} \right) /; |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{i(z^2-1)}{2z}\right)$

01.27.27.1529.01

$$\tanh^{-1}(z) = \frac{1}{2} i \left(\sec^{-1} \left(\frac{i(z^2-1)}{2z} \right) - \frac{\pi}{2} \right) /; |z| < 1$$

01.27.27.1530.01

$$\tanh^{-1}(z) = -\frac{i}{2} \sec^{-1} \left(\frac{i(z^2-1)}{2z} \right) + \frac{3\pi i}{4} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1531.01

$$\tanh^{-1}(z) = -\frac{i}{2} \sec^{-1} \left(\frac{i(z^2-1)}{2z} \right) - \frac{\pi i}{4} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1532.01

$$\tanh^{-1}(z) = +\frac{\pi}{2} \left(-\frac{\sqrt{-z^2}}{z} + \frac{i}{2} \right) - \frac{1}{2} i \sec^{-1} \left(\frac{i(z^2-1)}{2z} \right) /; |z| > 1$$

01.27.27.1533.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1} \right)^2} \left(\frac{\sqrt{-z^2}}{z} - i \right) - \frac{\sqrt{-z^2}}{z} \right) + \frac{i(1-z)}{2(1+z)} \sqrt{\left(\frac{z+1}{z-1} \right)^2} \sec^{-1} \left(\frac{i(z^2-1)}{2z} \right) /; |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{1-z^2}{1+z^2}\right)$

01.27.27.1534.01

$$\tanh^{-1}(z) = -\frac{i}{2} \sec^{-1}\left(\frac{1-z^2}{1+z^2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1535.01

$$\tanh^{-1}(z) = \frac{1}{2} i \sec^{-1}\left(\frac{1-z^2}{1+z^2}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1536.01

$$\tanh^{-1}(z) = -\pi i + \frac{1}{2} i \sec^{-1}\left(\frac{1-z^2}{1+z^2}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1537.01

$$\tanh^{-1}(z) = \pi i - \frac{1}{2} i \sec^{-1}\left(\frac{1-z^2}{1+z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1538.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2-1}{z^2+1}\right)$

01.27.27.1539.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \frac{i}{2} \sec^{-1}\left(\frac{z^2-1}{z^2+1}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1540.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{1}{2} i \sec^{-1}\left(\frac{z^2-1}{z^2+1}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1541.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{1}{2} i \sec^{-1}\left(\frac{z^2-1}{z^2+1}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1542.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \frac{1}{2} i \sec^{-1}\left(\frac{z^2-1}{z^2+1}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1543.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{1-z^2}\right)$

01.27.27.1544.01

$$\tanh^{-1}(z) = -i \sec^{-1}\left(\sqrt{1-z^2}\right); -\pi < \arg(z) \leq 0$$

01.27.27.1545.01

$$\tanh^{-1}(z) = i \sec^{-1}\left(\sqrt{1-z^2}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1546.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

01.27.27.1547.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1548.01

$$\tanh^{-1}(z) = i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1549.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1550.01

$$\tanh^{-1}(z) = \frac{3\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1551.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

01.27.27.1552.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1553.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1554.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1555.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \sec^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1556.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

01.27.27.1557.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1558.01

$$\tanh^{-1}(z) = i \sec^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1559.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1560.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \sec^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1561.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

01.27.27.1562.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1} \left(\sqrt{\frac{z^2 - 1}{z^2}} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1563.01

$$\tanh^{-1}(z) = i \sec^{-1} \left(\sqrt{\frac{z^2 - 1}{z^2}} \right) - \frac{\pi i}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1564.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - i \sec^{-1} \left(\sqrt{\frac{z^2 - 1}{z^2}} \right) ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1565.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + i \sec^{-1} \left(\sqrt{\frac{z^2 - 1}{z^2}} \right) ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1566.01

$$\tanh^{-1}(z) = \frac{\pi z \sqrt{z^2 - 1}}{2 \sqrt{z^2 - z^4}} - \sqrt{-\frac{1}{z^2}} z \sec^{-1} \left(\sqrt{\frac{z^2 - 1}{z^2}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1} \left(\frac{\sqrt{2} (1 - z^2)^{1/4}}{\sqrt{\sqrt{1 - z^2} + 1}} \right)$

01.27.27.1567.01

$$\tanh^{-1}(z) = 2i \sec^{-1} \left(\frac{\sqrt{2} (1 - z^2)^{1/4}}{\sqrt{\sqrt{1 - z^2} + 1}} \right) ; 0 < \arg(z) \leq \pi$$

01.27.27.1568.01

$$\tanh^{-1}(z) = -2i \sec^{-1} \left(\frac{\sqrt{2} (1 - z^2)^{1/4}}{\sqrt{\sqrt{1 - z^2} + 1}} \right) ; -\pi < \arg(z) \leq 0$$

01.27.27.1569.01

$$\tanh^{-1}(z) = -\frac{2 \sqrt{-z^2}}{z} \sec^{-1} \left(\frac{\sqrt{2} (1 - z^2)^{1/4}}{\sqrt{\sqrt{1 - z^2} + 1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}}\right)$

01.27.27.1570.01

$$\tanh^{-1}(z) = \pi i - 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1571.01

$$\tanh^{-1}(z) = 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}}\right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.1572.01

$$\tanh^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(2 \sec^{-1}\left(\frac{\sqrt{2}\sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) - \pi \right)$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}+1}}\right)$

01.27.27.1573.01

$$\tanh^{-1}(z) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}+1}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1574.01

$$\tanh^{-1}(z) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}+1}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.1575.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right)$

01.27.27.1576.01

$$\tanh^{-1}(z) = \pi i - 2i \operatorname{sec}^{-1} \left(\frac{2\sqrt{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1577.01

$$\tanh^{-1}(z) = 2i \operatorname{sec}^{-1} \left(\frac{2\sqrt{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) - \pi i ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1578.01

$$\tanh^{-1}(z) = \frac{z\sqrt{z^2-1}}{\sqrt{z^2-z^4}} \left(\pi - 2 \operatorname{sec}^{-1} \left(\frac{2\sqrt{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sec}^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right)$

01.27.27.1579.01

$$\tanh^{-1}(z) = -2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1580.01

$$\tanh^{-1}(z) = 2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1581.01

$$\tanh^{-1}(z) = -2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1582.01

$$\tanh^{-1}(z) = -2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1583.01

$$\tanh^{-1}(z) = -2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}+z}} \right) - \frac{\pi i}{2} \left(1 + 2i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \sqrt{1-z} \sqrt{\frac{1}{1-z}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right)$

01.27.27.1584.01

$$\tanh^{-1}(z) = 2i \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1585.01

$$\tanh^{-1}(z) = -2i \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1586.01

$$\tanh^{-1}(z) = 2i \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1587.01

$$\tanh^{-1}(z) = 2i \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1588.01

$$\tanh^{-1}(z) = 2\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sec^{-1} \left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) + \frac{\pi i}{2} \left(1 + 2i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i\sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}}\right)$

01.27.27.1589.01

$$\tanh^{-1}(z) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1590.01

$$\tanh^{-1}(z) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}}\right) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1591.01

$$\tanh^{-1}(z) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1592.01

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

Involving $\tanh^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right)$

01.27.27.1593.01

$$\tanh^{-1}(z) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1594.01

$$\tanh^{-1}(z) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1595.01

$$\tanh^{-1}(z) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1596.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.1597.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{1+z}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1598.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sec^{-1}\left(\frac{1-z}{1+z}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1599.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{1+z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1600.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.1601.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{z+1}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1602.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{z-1}{z+1}\right) - \frac{\pi i}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1603.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{z+1}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1604.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.1605.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right); |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1606.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4}; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1607.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \left(\sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi}{2} \right); |z| < 1$$

01.27.27.1608.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) + \frac{\pi i}{4}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1609.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1610.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{2z} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi\sqrt{-z^2}}{4z}; |z| > 1$$

01.27.27.1611.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi\sqrt{-z^2}}{4z}; |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.1612.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{4}; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1613.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1614.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) \right); |z| < 1$$

01.27.27.1615.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{3\pi i}{4}; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1616.01

$$\tanh^{-1}(\sqrt{z}) = \frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1617.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{2z} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi\sqrt{-z^2}}{4z}; |z| > 1$$

01.27.27.1618.01

$$\tanh^{-1}(\sqrt{z}) = \left(-1 + 2 \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \right) \frac{\pi \sqrt{-z^2}}{4z} - \frac{\sqrt{-z^2} (1+z)}{2z(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}(\sqrt{1-z})$

01.27.27.1619.01

$$\tanh^{-1}(\sqrt{z}) = i \sec^{-1}(\sqrt{1-z}); 0 < \arg(z) \leq \pi$$

01.27.27.1620.01

$$\tanh^{-1}(\sqrt{z}) = -i \sec^{-1}(\sqrt{1-z}); -\pi < \arg(z) \leq 0$$

01.27.27.1621.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\sqrt{-z^2}}{z} \sec^{-1}(\sqrt{1-z})$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.1622.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1623.01

$$\tanh^{-1}(\sqrt{z}) = i \sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.1624.01

$$\tanh^{-1}(\sqrt{z}) = -i \sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1625.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

01.27.27.1626.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.1627.01

$$\tanh^{-1}(\sqrt{z}) = i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1628.01

$$\tanh^{-1}(\sqrt{z}) = -i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1629.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

01.27.27.1630.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right) ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1631.01

$$\tanh^{-1}(\sqrt{z}) = i \sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right) - \frac{\pi i}{2} ; \text{Im}(z) < 0$$

01.27.27.1632.01

$$\tanh^{-1}(\sqrt{z}) = -i \sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1633.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1}\right)$

01.27.27.1634.01

$$\tanh^{-1}(\sqrt{z}) = 2 i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) ; 0 < \arg(z) \leq \pi$$

01.27.27.1635.01

$$\tanh^{-1}(\sqrt{z}) = -2 i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) ; -\pi < \arg(z) \leq 0$$

01.27.27.1636.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2 \sqrt{-z^2}}{z} \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - 1}\right)$

01.27.27.1637.01

$$\tanh^{-1}(\sqrt{z}) = \pi i - 2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}} \right); 0 < \arg(z) \leq \pi$$

01.27.27.1638.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{sec}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}} \right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.1639.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{z} \left(2 \operatorname{sec}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}} \right) - \pi \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sec}^{-1} \left(\sqrt{2\sqrt{1-z} / (\sqrt{1-z} + 1)} \right)$

01.27.27.1640.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{sec}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + 1}} \right); 0 < \arg(z) \leq \pi$$

01.27.27.1641.01

$$\tanh^{-1}(\sqrt{z}) = -2i \operatorname{sec}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + 1}} \right); -\pi < \arg(z) \leq 0$$

01.27.27.1642.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sec}^{-1} \left(\sqrt{2\sqrt{1-z} / (\sqrt{1-z} - 1)} \right)$

01.27.27.1643.01

$$\tanh^{-1}(\sqrt{z}) = \pi i - 2i \operatorname{sec}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - 1}} \right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1644.01

$$\tanh^{-1}(\sqrt{z}) = 2i \operatorname{sec}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - 1}} \right) - \pi i; -\pi < \arg[z] < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1645.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \left(\sqrt{\sqrt{1-z} + \sqrt{-z}}\right)\right)$

01.27.27.1646.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1647.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1648.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1649.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{2\sqrt{-z^2}} + \frac{2\sqrt{1-z}\sqrt{-z^2}}{z} \sqrt{\frac{1}{1-z}} \sec^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \left(\sqrt{\sqrt{1-z} - \sqrt{-z}}\right)\right)$

01.27.27.1650.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1651.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1652.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{2\sqrt{-z^2}}{z} \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) + \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} + \sqrt{-z})\right)$

01.27.27.1653.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1654.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sec^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}} \right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1655.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}} \right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1656.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sec^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z} - \sqrt{-z})}\right)$

01.27.27.1657.01

$$\tanh^{-1}(\sqrt{z}) = 2i \sec^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - \sqrt{-z}}} \right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1658.01

$$\tanh^{-1}(\sqrt{z}) = -2i \sec^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} - \sqrt{-z}}} \right) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.1659.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.1660.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{1+z}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1661.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2}i \sec^{-1}\left(\frac{1-z}{1+z}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.1662.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2}i \sec^{-1}\left(\frac{1-z}{1+z}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1663.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.1664.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{z+1}\right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1665.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{z-1}{z+1}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.1666.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{z-1}{z+1}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1667.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.1668.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} i \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4} /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1669.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) + \frac{\pi i}{4} /; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.1670.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1671.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi}{2} \left(\sqrt{z} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z^2}}{2z} \right) /; |z| < 1$$

01.27.27.1672.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4} /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1673.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1674.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) \right); |z| > 1$$

01.27.27.1675.01

$$\begin{aligned} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \\ \frac{\sqrt{-z^2}(1+z)}{2(z(1-z))} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sec^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi}{4} \left(\frac{i(1+z)}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \left(1 - \sqrt{-z} \sqrt{-\frac{1}{z}}\right) + \sqrt{-\frac{1}{z}} \sqrt{z} \right); |z| \neq 1 \end{aligned}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.1676.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi i}{4}; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1677.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{3\pi i}{4}; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.1678.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1679.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{-z^2}}{2z} - \sqrt{z} \sqrt{-\frac{1}{z}} \right) - \frac{\sqrt{-z^2}}{2z} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1$$

01.27.27.1680.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1681.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1682.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{2z} \left(\sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi}{2} \right); |z| > 1$$

01.27.27.1683.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}(1+z)}{2(z(1-z))} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) \right) - \frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} + 1 \right); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}(\sqrt{1-z})$

01.27.27.1684.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \sec^{-1}(\sqrt{1-z}) ; 0 < \arg(z) \leq \pi$$

01.27.27.1685.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \sec^{-1}(\sqrt{1-z}) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1686.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sec^{-1}(\sqrt{1-z}) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1687.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.1688.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) ; \operatorname{Im}(z) \geq 0$$

01.27.27.1689.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) ; \operatorname{Im}(z) < 0$$

01.27.27.1690.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

01.27.27.1691.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1692.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) ; \operatorname{Im}(z) < 0$$

01.27.27.1693.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \pi i ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1694.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

01.27.27.1695.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.27.27.1696.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\sqrt{\frac{z-1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.1697.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1}\right)$

01.27.27.1698.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.1699.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1700.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1701.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{2\sqrt{-z^2}}{z} \sec^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right) - \frac{\pi\sqrt{-1+z}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - 1}\right)$

01.27.27.1702.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{sec}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1703.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{sec}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1704.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{sec}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1705.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{2\sqrt{-z^2}}{z} \operatorname{sec}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-1+z}}{\sqrt{1-z}} + \frac{2\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sec}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}+1)}\right)$

01.27.27.1706.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \operatorname{sec}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1707.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{sec}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1708.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{sec}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1709.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sec}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-1)}\right)$

01.27.27.1710.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \operatorname{sec}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1711.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1712.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2}(1-z)^{1/4} / \sqrt{\sqrt{1-z} + \sqrt{-z}}\right)$

01.27.27.1713.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1714.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right); \operatorname{Im}(z) < 0$$

01.27.27.1715.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1716.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} \left(1 - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + \frac{2\sqrt{-z^2}\sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2}(1-z)^{1/4} / \sqrt{\sqrt{1-z} - \sqrt{-z}}\right)$

01.27.27.1717.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.1718.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i - 2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1719.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1720.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - \frac{2i\sqrt{-z^2}}{z} - 1 \right) - \frac{2\sqrt{-z^2}}{z} \sec^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}+\sqrt{-z})}\right)$

01.27.27.1721.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1722.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right); \operatorname{Im}(z) < 0$$

01.27.27.1723.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1724.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-\sqrt{-z})}\right)$

01.27.27.1725.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.1726.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i - 2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1727.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2i \sec^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1728.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\sec^{-1}(\sqrt{z})$

01.27.27.1729.01

$$\tanh^{-1}(\sqrt{1-z}) = -i \sec^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1730.01

$$\tanh^{-1}(\sqrt{1-z}) = i \sec^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1731.01

$$\tanh^{-1}(\sqrt{1-z}) = -\frac{\sqrt{z-1}}{\sqrt{1-z}} \sec^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\sec^{-1}(\sqrt{z})$

01.27.27.1732.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \sec^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.27.27.1733.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \sec^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1734.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \sec^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1735.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\sec^{-1}(\sqrt{z})$

01.27.27.1736.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} - i \sec^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1737.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \sec^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.1738.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \sec^{-1}(\sqrt{z}) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1739.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1740.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1741.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1742.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1743.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1744.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1745.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1746.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1747.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1748.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.27.27.1749.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1750.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1751.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.1752.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.27.27.1753.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1754.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1755.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1756.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1757.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1758.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1759.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1760.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1761.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1762.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.1763.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1764.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1765.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1766.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1767.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1768.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1769.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1770.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1771.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1772.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1773.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.1774.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.27.27.1775.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1776.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.1777.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1778.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1779.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1780.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.1781.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \text{Im}(z) > 0$$

01.27.27.1782.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.27.27.1783.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1784.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1785.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1786.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; \text{Im}(z) < 0$$

01.27.27.1787.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1788.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1789.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1790.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1791.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1792.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1793.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1794.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1795.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1796.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{\sqrt{-z-1}}{2\sqrt{z+1}} \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{-z} z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1797.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.1798.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.1799.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1800.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1801.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1802.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1803.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1804.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{\sqrt{-z-1}}{2\sqrt{z+1}} \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{-z} z \sqrt{z^2-1}}{2\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}}$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1805.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1806.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1807.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{i}{2} \sec^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1808.01

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

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$ and $\sec^{-1}(z)$

01.27.27.1809.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \sec^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1810.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \sec^{-1}(z); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1811.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -i \sec^{-1}(z) + \pi i; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1812.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = i \sec^{-1}(z) - \pi i; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1813.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} + \frac{z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\right) \frac{\pi}{2} - \frac{z\sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sec^{-1}(z)$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.27.27.1814.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i \sec^{-1}(z) \quad ; \quad \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1815.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \sec^{-1}(z) - \frac{\pi i}{2} \quad ; \quad \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1816.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \sec^{-1}(z) - \frac{3\pi i}{2} \quad ; \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1817.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \sec^{-1}(z) - \frac{\pi i}{2} \quad ; \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1818.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.27.27.1819.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi i}{2} - i \sec^{-1}(z) \quad ; \quad \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1820.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \sec^{-1}(z) - \frac{\pi i}{2} \quad ; \quad \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1821.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \sec^{-1}(z) - \frac{3\pi i}{2} \quad ; \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1822.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \sec^{-1}(z) - \frac{\pi i}{2} \quad ; \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1823.01

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

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

Involving $\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\sec^{-1}(z)$

01.27.27.1824.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -i\sec^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1825.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = i\sec^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1) \bigvee (iz \in \mathbb{R} \wedge iz < 0)$$

01.27.27.1826.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\pi i + i\sec^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1) \bigvee (iz \in \mathbb{R} \wedge iz > 0)$$

01.27.27.1827.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \pi i - i\sec^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1828.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1829.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i\sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1830.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1831.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1832.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.0025.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right); z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.1833.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1834.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1835.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1836.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1837.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1838.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \left(\sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} - \frac{i\sqrt{z^2-z^4}}{z\sqrt{-1+z^2}} - 1\right) \frac{\pi i}{2} - \frac{\sqrt{z^2-z^4}}{z\sqrt{z^2-1}} \sec^{-1}\left(\frac{1}{z}\right)$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1839.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1840.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1841.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1842.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1843.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1844.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1845.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1846.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\frac{3\pi i}{2} + i \sec^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1847.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1848.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1849.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \sec^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.1850.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1851.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \pi i - i \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1852.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.1853.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1854.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = i \sec^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1855.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1856.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1857.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi i - i \sec^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1858.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1859.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \sec^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.1860.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.1861.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.1862.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \pi i - i \sec^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.1863.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1864.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \sec^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1865.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -i \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1866.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\pi i + i \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1867.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi i - i \sec^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1868.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+1}}{z}\right)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.27.27.1869.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.1870.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{3\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.1871.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2-1}}{z}\right)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.27.27.1872.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1-1}}{z}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}$$

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.27.27.1873.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1+1}}\right) = -\frac{i}{2} \sec^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right)$ and $\sec^{-1}\left(\frac{i}{z}\right)$

01.27.27.1874.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.1875.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{3\pi i}{4} - \frac{i}{2} \sec^{-1}\left(\frac{i}{z}\right); \operatorname{Im}(z) < 0 \vee z < 0$$

01.27.27.1876.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$ and $\sec^{-1}(z)$

01.27.27.1877.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = 2i \sec^{-1}(z) - \pi i; |z| > \sqrt{2} \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1878.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \pi i - 2i \sec^{-1}(z); |z| > \sqrt{2} \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1879.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\theta \left(\left| \sqrt{z^2-1} \right| - 1 \right) + \frac{\sqrt{z^2}}{z} - 1 \right) \pi - \frac{2\sqrt{z^2}}{z} \sec^{-1}(z)$$

01.27.27.1880.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \right. \right. \\ & \left. \left. \sqrt{-\frac{i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \left(\frac{\pi}{2} - \sec^{-1}(z) \right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.27.27.1881.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + 2i \sec^{-1}(z) ; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1882.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - 2i \sec^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1883.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{3\pi i}{2} + 2i \sec^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1884.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{3\pi i}{2} - 2i \sec^{-1}(z) ; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1885.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1886.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i - 2i \sec^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2} \vee -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1887.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\frac{\sqrt{z^2-1}}{\sqrt{1-z^2}}\left(2\sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\left(\frac{\sqrt{z^2-1}z}{\sqrt{z^4-z^2}} + \sqrt{\frac{1}{z}}\sqrt{\frac{1}{\sqrt{2}z-1}}\sqrt{\sqrt{2}z-1}\sqrt{z} - \sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{-\sqrt{2}z-1}\sqrt{-\frac{1}{\sqrt{2}z+1}} + \frac{\sqrt{z^2}}{z} - 2\right)\right)$$

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

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.27.27.1888.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2i\sec^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.1889.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + 2i\sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1890.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} + 2i\sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.1891.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2i\sec^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.1892.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2i\sec^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1893.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{5\pi i}{2} + 2i\sec^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1894.01

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

Involving \sinh^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{2z}{1-z^2}\right)$

01.27.27.1895.01

$$\tanh^{-1}(z) = \frac{1}{2} \sinh^{-1}\left(\frac{2z}{1-z^2}\right); |z| < 1$$

01.27.27.1896.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{1}{2} \sinh^{-1}\left(\frac{2z}{1-z^2}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1897.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{1}{2} \sinh^{-1}\left(\frac{2z}{1-z^2}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1898.01

$$\tanh^{-1}(z) = -\frac{1}{2} \sinh^{-1}\left(\frac{2z}{1-z^2}\right) - \frac{\pi \sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.1899.01

$$\tanh^{-1}(z) = \frac{1-iz}{2(1+iz)} \sqrt{\frac{(iz+1)^2}{(iz-1)^2}} \sinh^{-1}\left(\frac{2z}{1-z^2}\right) - \frac{\pi \sqrt{-z^2}}{4z} \left(1 - \frac{1-iz}{1+iz} \sqrt{\frac{(iz+1)^2}{(iz-1)^2}} \right); |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{2z}{z^2-1}\right)$

01.27.27.3491.01

$$\tanh^{-1}(z) = -\frac{1}{2} \sinh^{-1}\left(\frac{2z}{z^2-1}\right); |z| < 1$$

01.27.27.3492.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}\left(\frac{2z}{z^2-1}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.3493.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}\left(\frac{2z}{z^2-1}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.3494.01

$$\tanh^{-1}(z) = \frac{1}{2} \sinh^{-1}\left(\frac{2z}{z^2-1}\right) - \frac{\pi\sqrt{-z^2}}{2z} \quad ; |z| > 1$$

01.27.27.3495.01

$$\tanh^{-1}(z) = -\frac{1-iz}{2(1+iz)} \sqrt{\left(\frac{iz+1}{iz-1}\right)^2} \sinh^{-1}\left(\frac{2z}{z^2-1}\right) - \frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1-iz}{1+iz} \sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right) \quad ; |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right)$

01.27.27.1900.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right) \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1901.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right) \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1902.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right) \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1903.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right) \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1904.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \frac{i\sqrt{-z^2}}{z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) - \frac{i\sqrt{-z^2} \sqrt{1-z^2}}{2z} \sqrt{\frac{1}{1-z^2}} \sinh^{-1}\left(\frac{i(1+z^2)}{1-z^2}\right)$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{i(z^2+1)}{z^2-1}\right)$

01.27.27.1905.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} \sinh^{-1}\left(\frac{i(z^2+1)}{z^2-1}\right) \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1906.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} \sinh^{-1}\left(\frac{i(z^2+1)}{z^2-1}\right) \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1907.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2} \sinh^{-1}\left(\frac{i(z^2+1)}{z^2-1}\right) \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1908.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2} \sinh^{-1}\left(\frac{i(z^2+1)}{z^2-1}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1909.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

01.27.27.1910.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1911.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1912.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1913.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1914.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

01.27.27.1915.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.1916.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.1917.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.1918.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.1919.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

01.27.27.1920.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.1921.01

$$\tanh^{-1}(z) = \pi i - \sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1922.01

$$\tanh^{-1}(z) = -\pi i - \sinh^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1923.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

01.27.27.1924.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1925.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1926.01

$$\tanh^{-1}(z) = \pi i + \sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1927.01

$$\tanh^{-1}(z) = -\pi i - \sinh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1928.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

01.27.27.1929.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1930.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1931.01

$$\tanh^{-1}(z) = \pi i - \sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1932.01

$$\tanh^{-1}(z) = -\pi i + \sinh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1933.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

01.27.27.1934.01

$$\tanh^{-1}(z) = \sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1935.01

$$\tanh^{-1}(z) = -\sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1936.01

$$\tanh^{-1}(z) = \pi i - \sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1937.01

$$\tanh^{-1}(z) = -\pi i + \sinh^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1938.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{-\sqrt{1-z^2}-1}{\sqrt{2}(1-z^2)^{1/4}}}\right)$

01.27.27.1939.01

$$\tanh^{-1}(z) = -2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z^2}-1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) + \pi i /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1940.01

$$\tanh^{-1}(z) = -2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z^2}-1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) - \pi i /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1941.01

$$\tanh^{-1}(z) = 2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z^2}-1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1942.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z^2}-1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) - \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \left(z \in \mathbb{R} \wedge 0 < z < 1 \right)$$

01.27.27.1943.01

$$\tanh^{-1}(z) = -\frac{2\sqrt{-z}\sqrt{z^2-1}}{\sqrt{z}\sqrt{1-z^2}} \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z^2}-1}}{\sqrt{2}\sqrt[4]{1-z^2}} \right) - \frac{\pi\sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{1-\sqrt{1-z^2}}}{(\sqrt{2}(1-z^2)^{1/4})} \right)$

01.27.27.1944.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\sqrt[4]{1-z^2}} \right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1945.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\sqrt[4]{1-z^2}} \right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1946.01

$$\tanh^{-1}(z) = \frac{2\sqrt{z^2}}{z} \sinh^{-1} \left(\frac{\sqrt{1-\sqrt{1-z^2}}}{\sqrt{2}\sqrt[4]{1-z^2}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{-\left(\sqrt{1-z^2}+1\right)}}{2\sqrt{1-z^2}} \right)$

01.27.27.1947.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{1-z^2}+1}{2\sqrt{1-z^2}} \right) + \pi i /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.1948.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) - \pi i /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.1949.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) + \pi i /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.1950.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z^2} + 1}{2\sqrt{1-z^2}}} \right) - \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.1951.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1} \left(\sqrt{\frac{1 - \sqrt{1-z^2}}{2\sqrt{1-z^2}}} \right)$

01.27.27.1952.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\sqrt{\frac{1 - \sqrt{1-z^2}}{2\sqrt{1-z^2}}} \right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.1953.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{\frac{1 - \sqrt{1-z^2}}{2\sqrt{1-z^2}}} \right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.1954.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1} \left(\sqrt{-\sqrt{z^2-1} - z} / (\sqrt{2} (z^2-1)^{1/4}) \right)$

01.27.27.1955.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\frac{\sqrt{-z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1956.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\frac{\sqrt{-z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1957.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{-z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1958.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} + i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \right) - 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \sinh^{-1} \left(\frac{\sqrt{-z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{z - \sqrt{z^2 - 1}}}{(\sqrt{2} (z^2 - 1)^{1/4})} \right)$

01.27.27.1959.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.1960.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\frac{\sqrt{z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1961.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\frac{\sqrt{z - \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1962.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{-(\sqrt{z^2-1}+z)}{(2\sqrt{z^2-1})}}\right)$

01.27.27.1963.01

$$\tanh^{-1}(z) = 2\sinh^{-1}\left(\sqrt{-\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.1964.01

$$\tanh^{-1}(z) = 2\sinh^{-1}\left(\sqrt{-\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) + \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.1965.01

$$\tanh^{-1}(z) = -2\sinh^{-1}\left(\sqrt{-\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1966.01

$$\tanh^{-1}(z) = -2\sinh^{-1}\left(\sqrt{-\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.1967.01

$$\tanh^{-1}(z) = 2\sinh^{-1}\left(\sqrt{-\frac{z+\sqrt{z^2-1}}{2\sqrt{z^2-1}}}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1968.01

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

Involving $\tanh^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{(z-\sqrt{z^2-1})}{(2\sqrt{z^2-1})}}\right)$

01.27.27.1969.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\sqrt{\frac{z - \sqrt{z^2 - 1}}{2\sqrt{z^2 - 1}}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1970.01

$$\tanh^{-1}(z) = 2 \sinh^{-1} \left(\sqrt{\frac{z - \sqrt{z^2 - 1}}{2\sqrt{z^2 - 1}}} \right) - \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1971.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{\frac{z - \sqrt{z^2 - 1}}{2\sqrt{z^2 - 1}}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.1972.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{\frac{z - \sqrt{z^2 - 1}}{2\sqrt{z^2 - 1}}} \right) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.1973.01

$$\tanh^{-1}(z) = -2 \sinh^{-1} \left(\sqrt{\frac{z - \sqrt{z^2 - 1}}{2\sqrt{z^2 - 1}}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.1974.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{i(1+z)}{1-z}\right)$

01.27.27.1975.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \sinh^{-1} \left(\frac{i(1+z)}{1-z} \right) + \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi$$

01.27.27.1976.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sinh^{-1} \left(\frac{i(1+z)}{1-z} \right) - \frac{\pi i}{4} ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1977.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \sinh^{-1} \left(\frac{i(1+z)}{1-z} \right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1978.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) - \frac{i\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \sinh^{-1}\left(\frac{i(1+z)}{1-z}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{i(z+1)}{z-1}\right)$

01.27.27.1979.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) + \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi$$

01.27.27.1980.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) - \frac{\pi i}{4} ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1981.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1982.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) + \frac{i\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right)$

01.27.27.1983.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) ; |z| < 1$$

01.27.27.1984.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) ; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1985.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} - \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) ; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1986.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) - \frac{\pi\sqrt{-z^2}}{2z} ; |z| > 1$$

01.27.27.1987.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \right) + \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) ; |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right)$

01.27.27.1988.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right); |z| < 1$$

01.27.27.1989.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.1990.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.1991.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) - \frac{\pi\sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.1992.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2}\right) - \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

01.27.27.1993.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.1994.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.1995.01

$$\tanh^{-1}(\sqrt{z}) = -\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.1996.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

01.27.27.1997.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.1998.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.1999.01

$$\tanh^{-1}(\sqrt{z}) = -\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2000.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

01.27.27.2001.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) /; z \notin (1, \infty)$$

01.27.27.2002.01

$$\tanh^{-1}(\sqrt{z}) = -\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2003.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

01.27.27.2004.01

$$\tanh^{-1}(\sqrt{z}) = -\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) /; z \notin (0, \infty)$$

01.27.27.2005.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2006.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2007.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

01.27.27.2008.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right); z \notin (1, \infty)$$

01.27.27.2009.01

$$\tanh^{-1}(\sqrt{z}) = \sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2010.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{(\sqrt{2}(1-z)^{1/4})}\right)$

01.27.27.2011.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.2012.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \pi i; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2013.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2014.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi \sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{(\sqrt{2}(1-z)^{1/4})}\right)$

01.27.27.2015.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{-(\sqrt{1-z}+1)}}{(2\sqrt{1-z})}\right)$

01.27.27.2016.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}} \right) + \pi i /; \operatorname{Im}(z) > 0$$

01.27.27.2017.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}} \right) - \pi i /; -\pi < \arg(z) \leq 0$$

01.27.27.2018.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1} \left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}} \right) + \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2019.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1} \left(\sqrt{(1-\sqrt{1-z})/(2\sqrt{1-z})} \right)$

01.27.27.2020.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1} \left(\sqrt{-\sqrt{1-z}-\sqrt{-z}} / (\sqrt{2} (1-z)^{1/4}) \right)$

01.27.27.2021.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.2022.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2023.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2024.01

$$\tanh^{-1}(\sqrt{z}) = 2\sqrt{1-z} \sqrt{\frac{1}{1-z}} \sinh^{-1} \left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) + \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{i\sqrt{-z^2}}{2z} - 1 \right) \pi i$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{\sqrt{-z} - \sqrt{1-z}}}{\sqrt{2} (1-z)^{1/4}}\right)$

01.27.27.2025.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z} - \sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2026.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z} - \sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2027.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z} - \sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2028.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sqrt{z} \sqrt{\frac{1}{z}} \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z} - \sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi \sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{-(\sqrt{1-z} + \sqrt{-z})}}{2 \sqrt{1-z}}\right)$

01.27.27.2029.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z} + \sqrt{-z}}{2 \sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2030.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z} + \sqrt{-z}}{2 \sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2031.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z} + \sqrt{-z}}{2 \sqrt{1-z}}}\right) - \frac{3 \pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2032.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{\sqrt{(\sqrt{-z} - \sqrt{1-z})}}{2 \sqrt{1-z}}\right)$

01.27.27.2033.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}} \right) + \frac{\pi i}{2} ; \operatorname{Im}(z) > 0$$

01.27.27.2034.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sinh^{-1} \left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}} \right) - \frac{\pi i}{2} ; -\pi < \arg(z) \leq 0$$

01.27.27.2035.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sinh^{-1} \left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}} \right) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2036.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{i(1+z)}{1-z}\right)$

01.27.27.2037.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{i(1+z)}{1-z}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2038.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z)}{1-z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0$$

01.27.27.2039.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{i(1+z)}{1-z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2040.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i\sqrt{z} \sqrt{-\frac{1}{z}} - 1 \right) - \frac{i\sqrt{1-z}\sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \sinh^{-1}\left(\frac{i(1+z)}{1-z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{i(z+1)}{z-1}\right)$

01.27.27.2041.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2042.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0$$

01.27.27.2043.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2044.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i\sqrt{z} \sqrt{-\frac{1}{z}} - 1 \right) + \frac{i\sqrt{1-z} \sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \sinh^{-1}\left(\frac{i(z+1)}{z-1}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right)$

01.27.27.2045.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) - \frac{\pi i}{2} /; |z| < 1 \wedge \operatorname{Im}(z) \geq 0$$

01.27.27.2046.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) + \frac{\pi i}{2} /; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.2047.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) - \frac{1}{2} (\pi\sqrt{z}) \sqrt{-\frac{1}{z}} /; |z| < 1$$

01.27.27.2048.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) /; |z| > 1$$

01.27.27.2049.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) + \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sinh^{-1}\left(\frac{2\sqrt{z}}{1-z}\right) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right)$

01.27.27.2050.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) - \frac{\pi i}{2} /; |z| < 1 \wedge \operatorname{Im}(z) \geq 0$$

01.27.27.2051.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) + \frac{\pi i}{2} /; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.2052.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) - \frac{1}{2}(\pi\sqrt{z})\sqrt{-\frac{1}{z}} \quad ; |z| < 1$$

01.27.27.2053.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) \quad ; |z| > 1$$

01.27.27.2054.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi\sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) - \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \sinh^{-1}\left(\frac{2\sqrt{z}}{z-1}\right) \quad ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

01.27.27.2055.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) \quad ; z \notin (0, 1)$$

01.27.27.2056.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z-1}}\right) - \pi i \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2057.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

01.27.27.2058.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) \quad ; z \notin (-\infty, 1)$$

01.27.27.2059.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) \quad ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2060.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z-1}}\right) - \pi i \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2061.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

01.27.27.2062.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2063.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.2064.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2065.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

01.27.27.2066.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2067.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.2068.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 0)$$

01.27.27.2069.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

01.27.27.2070.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.2071.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{\frac{z}{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.2072.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.2073.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2074.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2075.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2076.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2\sqrt{\frac{z}{z-1}}\sqrt{\frac{z-1}{z}}\sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \pi\left(\frac{\sqrt{z-1}}{2\sqrt{1-z}} + \frac{\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.2077.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2078.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2079.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sinh^{-1}\left(\frac{\sqrt{1-\sqrt{1-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{-(\sqrt{1-z}+1)}}{2\sqrt{1-z}}\right)$

01.27.27.2080.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2081.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2082.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2083.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2084.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{(1-\sqrt{1-z})/(2\sqrt{1-z})}\right)$

01.27.27.2085.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z}}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2086.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{\frac{1-\sqrt{1-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2087.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{-\sqrt{1-z}-\sqrt{-z}}/(\sqrt{2}(1-z)^{1/4})\right)$

01.27.27.2088.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.2089.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \pi i /; \operatorname{Im}(z) < 0$$

01.27.27.2090.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2091.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2092.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + 2i \sqrt{z} \sqrt{-\frac{1}{z}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \sinh^{-1}\left(\frac{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{\sqrt{-z}-\sqrt{1-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.2093.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z}-\sqrt{1-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) /; z \notin (-\infty, 1)$$

01.27.27.2094.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z}-\sqrt{1-z}}}{\sqrt{2}(1-z)^{1/4}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2095.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z}-\sqrt{1-z}}}{\sqrt{2}(1-z)^{1/4}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2096.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} - 1\right) \frac{\pi i}{2} + 2 \sqrt{\frac{1}{z}} \sqrt{z} \sinh^{-1}\left(\frac{\sqrt{\sqrt{-z}-\sqrt{1-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\frac{\sqrt{-(\sqrt{1-z}+\sqrt{-z})}}{2\sqrt{1-z}}\right)$

01.27.27.2097.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z}+\sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2098.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) + \pi i /; \operatorname{Im}(z) < 0$$

01.27.27.2099.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{-\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2100.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{(\sqrt{-z} - \sqrt{1-z})/(2\sqrt{1-z})}\right)$

01.27.27.2101.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}}\right) /; z \notin (-\infty, 1)$$

01.27.27.2102.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \sinh^{-1}\left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}}\right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2103.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \sinh^{-1}\left(\sqrt{\frac{\sqrt{-z} - \sqrt{1-z}}{2\sqrt{1-z}}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2104.01

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

Involving $\tanh^{-1}(\sqrt{1+z})$

Involving $\tanh^{-1}(\sqrt{1+z})$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2105.01

$$\tanh^{-1}(\sqrt{1+z}) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2106.01

$$\tanh^{-1}(\sqrt{1+z}) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.27.27.2107.01

$$\tanh^{-1}(\sqrt{1+z}) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2108.01

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

Involving $\tanh^{-1}(\sqrt{1+z})$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2109.01

$$\tanh^{-1}(\sqrt{1+z}) = \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.2110.01

$$\tanh^{-1}(\sqrt{1+z}) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2111.01

$$\tanh^{-1}(\sqrt{1+z}) = \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2112.01

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

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2113.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-1, 0)$$

01.27.27.2114.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2115.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2116.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.27.27.2117.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2118.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2119.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2120.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |\arg(z)| < \pi$$

01.27.27.2121.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2122.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2123.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) ; z \notin (-1, 0)$$

01.27.27.2124.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2125.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.27.27.2126.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; \text{Im}(z) \geq 0$$

01.27.27.2127.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; \text{Im}(z) < 0$$

01.27.27.2128.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.27.27.2129.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2130.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; \text{Im}(z) < 0$$

01.27.27.2131.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \sinh^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2132.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.27.27.2133.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2134.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) ; \operatorname{Im}(z) < 0$$

01.27.27.2135.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi i}{2} - \sinh^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2136.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.27.27.2137.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \sinh^{-1}(\sqrt{z}) ; z \notin (-\infty, -1)$$

01.27.27.2138.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \sinh^{-1}(\sqrt{z}) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2139.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

$$\text{01.27.27.2140.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \sinh^{-1}(\sqrt{z}) /; |\arg(z)| < \pi$$

$$\text{01.27.27.2141.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \sinh^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.2142.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = -\sinh^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

$$\text{01.27.27.2143.01} \\ \tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \sinh^{-1}(\sqrt{z}) + \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\sinh^{-1}(\sqrt{z})$

$$\text{01.27.27.2144.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sinh^{-1}(\sqrt{z}) /; z \notin (-\infty, -1)$$

$$\text{01.27.27.2145.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sinh^{-1}(\sqrt{z}) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.2146.01} \\ \tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sinh^{-1}(\sqrt{z}) + \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\sinh^{-1}(iz)$

$$\text{01.27.27.2147.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.2148.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4} ; \text{Im}(z) < 0$$

$$\text{01.27.27.2149.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.2150.01} \\ \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z-1}}{2\sqrt{1-z}} - \sqrt{z} \sqrt{-\frac{1}{z}} \right) + \frac{i\sqrt{z-1}}{2\sqrt{1-z}} \sinh^{-1}(iz)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\sinh^{-1}(iz)$

$$\text{01.27.27.2151.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

$$\text{01.27.27.2152.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4} ; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.2153.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.2154.01} \\ \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + \frac{i\sqrt{1-z}}{2\sqrt{z-1}} - 1 \right) - \frac{i\sqrt{1-z}}{2\sqrt{z-1}} \sinh^{-1}(iz)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\sinh^{-1}(iz)$

$$\text{01.27.27.2155.01} \\ \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4} ; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2156.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2157.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2158.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \sinh^{-1}(iz) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\sinh^{-1}(iz)$

01.27.27.2159.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4} ; \operatorname{Im}(z) > 0$$

01.27.27.2160.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.2161.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2162.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{4} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + i\sqrt{-z} \sqrt{\frac{1}{z} - 1} \right) - \frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \sinh^{-1}(iz)$$

01.27.27.2163.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\sinh^{-1}(iz)$

01.27.27.2164.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2165.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2166.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2167.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \sinh^{-1}(iz) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{-1+z^2}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-1-z}}{2\sqrt{1+z}} \right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\sinh^{-1}(iz)$

01.27.27.2168.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2169.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \sinh^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2170.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{1}{2} \sinh^{-1}(iz) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2171.01

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

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

Involving $\tanh^{-1}\left(\sqrt{1+z^2}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2172.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.2173.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; -\frac{\pi}{2} < \arg(z) \leq 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2174.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) \leq \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2175.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2176.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \frac{z\sqrt{-z^2-1}}{\sqrt{-z^4-z^2}} \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{z^2+1}}{2\sqrt{-z^2-1}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2177.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = \sinh^{-1}\left(\frac{1}{z}\right) ; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2178.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) ; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2179.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) - \pi i ; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2180.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = \sinh^{-1}\left(\frac{1}{z}\right) - \pi i ; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2181.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2182.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \sinh^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2183.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = -\sinh^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.2184.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) - \pi i; (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.2185.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \sinh^{-1}\left(\frac{1}{z}\right) - \pi i; (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2186.01

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

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

Involving $\tanh^{-1}\left(z \sqrt{\frac{1+z^2}{z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2187.01

$$\tanh^{-1}\left(z \sqrt{\frac{1+z^2}{z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq 0$$

01.27.27.2188.01

$$\tanh^{-1}\left(z \sqrt{\frac{1+z^2}{z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \pi$$

01.27.27.2189.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.0026.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \sinh^{-1}(z) /; iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.27.27.2190.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \sinh^{-1}(z) - \pi i /; (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.2191.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \sinh^{-1}(z) + \pi i /; (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.0027.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2192.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \sinh^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.2193.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -\sinh^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2194.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2195.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -\sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2196.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2197.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \sinh^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2198.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = -\sinh^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2199.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2200.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = -\sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2201.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} \left(\sqrt{1+z^2} \sqrt{\frac{1}{1+z^2} - 1} \right) + \frac{\sqrt{-z^2-z^4}}{z\sqrt{-1-z^2}} \sinh^{-1}(z)$$

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2202.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \sinh^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2203.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\sinh^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2204.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2205.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\sinh^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2206.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\sinh^{-1}(z)$

01.27.27.2207.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 \leq \arg(z) < \pi$$

01.27.27.2208.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0028.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2209.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2210.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2211.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2212.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2213.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2214.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2215.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2216.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi \quad \bigvee \quad (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2217.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge z < 0) \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2218.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2219.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) ; 0 \leq \arg(z) < \frac{\pi}{2} \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2220.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0 \quad \bigvee \quad (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2221.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi \quad \bigvee \quad (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2222.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge z < 0) \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2223.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+1}}{z}\right)$ and $\sinh^{-1}(z)$

01.27.27.2224.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}(z) ; 0 \leq \arg(z) < \pi$$

01.27.27.2225.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2226.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2-1}}{z}\right)$ and $\sinh^{-1}(z)$

01.27.27.2227.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2228.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2229.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}(z) ; 0 \leq \arg(z) < \pi$$

01.27.27.2230.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{2} + \frac{1}{2} \sinh^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2231.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2232.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = 2 \sinh^{-1}\left(\frac{1}{z}\right) ; |z| > \sqrt{2} \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2233.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = -2 \sinh^{-1}\left(\frac{1}{z}\right) ; |z| > \sqrt{2} \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.27.27.2234.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = \frac{\sqrt{z^2+1}}{\sqrt{-z^2-1}} \left(\frac{2\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{1}{z}\right) - \left(\theta\left(\left|\sqrt{-z^2-1}\right|-1\right)-1\right)\pi \right)$$

01.27.27.2235.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = & \frac{\pi}{2\sqrt{z^2+1}} \left(-iz \sqrt{1+\frac{1}{z^2}} \left(i \sqrt{-\frac{1}{z^2}} z + \sqrt{\frac{1}{z}} \sqrt{z} - \sqrt{\frac{z}{i+z}} \sqrt{\frac{i+z}{z}} - \sqrt{-\frac{1}{z}} \sqrt{-z} + \sqrt{\frac{-i+z}{z}} \sqrt{\frac{z}{-i+z}} \right) - \right. \\ & \left. (z^2+2) \sqrt{-\frac{z^2+1}{z^4}} \sqrt{-\frac{z^4}{z^2+1}} \sqrt{-\frac{z^2+1}{(z^2+2)^2}} \right) + \frac{2z}{\sqrt{z^2+1}} \sqrt{1+\frac{1}{z^2}} \sinh^{-1}\left(\frac{1}{z}\right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.27.27.2236.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + 2 \sinh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \quad (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.2237.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + 2 \sinh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.2238.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} - 2 \sinh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.2239.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = \frac{\pi i}{2} - 2 \sinh^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \quad (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.2240.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} - 2 \sinh^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.2241.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} + 2 \sinh^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.2242.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{1+2z^2}\right)$ and $\sinh^{-1}(z)$

01.27.27.2243.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right) = 2\sinh^{-1}(z) /; -\frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.27.27.2244.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right) &= \frac{\pi i}{2} \left(-\frac{i\sqrt{-z^2}}{z} + \sqrt{\frac{i}{-i}} \sqrt{i z} \sqrt{\frac{1}{i\sqrt{2}z-1}} \sqrt{i\sqrt{2}z-1} - \right. \\ &\quad \left. \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{-i\sqrt{2}z-1} \sqrt{-\frac{1}{\sqrt{2}iz+1}} + \frac{iz\sqrt{-z^2-1}}{\sqrt{z^4+z^2}} \right) + 2\sinh^{-1}(z) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{1+2z^2}{2z\sqrt{z^2+1}}\right)$ and $\sinh^{-1}(z)$

01.27.27.2245.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + 2\sinh^{-1}(z) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) < \pi \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.2246.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + 2\sinh^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2247.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} + 2\sinh^{-1}(z) /; (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.2248.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = \frac{3\pi i}{2} + 2\sinh^{-1}(z) /; (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2249.01

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

Involving \cosh^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\cosh^{-1}\left(\frac{2iz}{1-z^2}\right)$

01.27.27.2250.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{1-z^2}\right); |z| < 1 \wedge \operatorname{Re}(z) \geq 0 \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.2251.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{1-z^2}\right); |z| > 1 \wedge 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.2252.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{1-z^2}\right); |z| < 1 \wedge \operatorname{Re}(z) < 0 \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2253.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{1-z^2}\right); |z| > 1 \wedge \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2254.01

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

Involving $\tanh^{-1}(z)$ and $\cosh^{-1}\left(\frac{2iz}{z^2-1}\right)$

01.27.27.2255.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| < 1 \wedge \operatorname{Re}(z) > 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.2256.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| > 1 \wedge -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.2257.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| < 1 \wedge \operatorname{Re}(z) \leq 0 \vee \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.2258.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| > 1 \wedge -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2259.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \sqrt{-\frac{i}{z}} \sqrt{-iz} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| < 1 \vee 0 < \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.2260.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} i \sqrt{\frac{i}{z}} \sqrt{iz} \cosh^{-1}\left(\frac{2iz}{z^2-1}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.3496.01

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

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

01.27.27.2261.01

$$\tanh^{-1}(z) = \frac{1}{2} \cosh^{-1}\left(\frac{1+z^2}{1-z^2}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2262.01

$$\tanh^{-1}(z) = -\frac{1}{2} \cosh^{-1}\left(\frac{1+z^2}{1-z^2}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2263.01

$$\tanh^{-1}(z) = \frac{1}{2} \cosh^{-1}\left(\frac{1+z^2}{1-z^2}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2264.01

$$\tanh^{-1}(z) = \pi i - \frac{1}{2} \cosh^{-1}\left(\frac{1+z^2}{1-z^2}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2265.01

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

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

01.27.27.2266.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \frac{1}{2} \cosh^{-1}\left(\frac{z^2+1}{z^2-1}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.2267.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \frac{1}{2} \cosh^{-1}\left(\frac{z^2+1}{z^2-1}\right) /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.2268.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{1}{2} \cosh^{-1}\left(\frac{z^2+1}{z^2-1}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2269.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{1}{2} \cosh^{-1}\left(\frac{z^2+1}{z^2-1}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2270.01

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

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

01.27.27.2271.01

$$\tanh^{-1}(z) = \cosh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2272.01

$$\tanh^{-1}(z) = -\cosh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2273.01

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

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

01.27.27.2274.01

$$\tanh^{-1}(z) = \cosh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2275.01

$$\tanh^{-1}(z) = -\cosh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2276.01

$$\tanh^{-1}(z) = \pi i - \cosh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2277.01

$$\tanh^{-1}(z) = -\pi i + \cosh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2278.01

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

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

01.27.27.2279.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2280.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2281.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2282.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.2283.01

$$\tanh^{-1}(z) = \frac{3\pi i}{2} - \cosh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2284.01

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

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

01.27.27.2285.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2286.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2287.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2288.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2289.01

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

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

01.27.27.2290.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; 0 < \arg[z] < \frac{\pi}{2}$$

01.27.27.2291.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.2292.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2293.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2294.01

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

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

01.27.27.2295.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; 0 < \arg[z] < \frac{\pi}{2}$$

01.27.27.2296.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.2297.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2298.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2299.01

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

Involving $\tanh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z^2} + 1} / (\sqrt{2} (1-z^2)^{1/4})\right)$

01.27.27.2300.01

$$\tanh^{-1}(z) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2301.01

$$\tanh^{-1}(z) = -2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} \sqrt[4]{1-z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2302.01

$$\tanh^{-1}(z) = \frac{2 \sqrt{z^2}}{z} \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z^2} + 1}}{\sqrt{2} (1-z^2)^{1/4}}\right)$$

Involving $\tanh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z^2} - 1} / (\sqrt{2} (1-z^2)^{1/4})\right)$

01.27.27.2303.01

$$\tanh^{-1}(z) = \pi i + 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.2304.01

$$\tanh^{-1}(z) = -\pi i + 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.2305.01

$$\tanh^{-1}(z) = \pi i - 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2306.01

$$\tanh^{-1}(z) = -\pi i - 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2307.01

$$\tanh^{-1}(z) = 2 \sqrt{\frac{1}{z^2}} z \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z^2} - 1}}{\sqrt{2} \sqrt[4]{1-z^2}} \right) + \frac{\pi \sqrt{z}}{\sqrt{-z}}$$

Involving $\tanh^{-1}(z)$ and $\cosh^{-1} \left(\sqrt{\left(\sqrt{1-z^2} + 1 \right) / \left(2 \sqrt{1-z^2} \right)} \right)$

01.27.27.2308.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} + 1}{2 \sqrt{1-z^2}}} \right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2309.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{1-z^2} + 1}{2 \sqrt{1-z^2}}} \right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2310.01

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

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

01.27.27.2311.01

$$\tanh^{-1}(z) = \pi i + 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2\sqrt{1-z^2}}}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.2312.01

$$\tanh^{-1}(z) = -\pi i + 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2\sqrt{1-z^2}}}\right) /; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.2313.01

$$\tanh^{-1}(z) = \pi i - 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2\sqrt{1-z^2}}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2314.01

$$\tanh^{-1}(z) = -\pi i - 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z^2}-1}{2\sqrt{1-z^2}}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2315.01

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

Involving $\tanh^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{\sqrt{z^2-1}+z}{(\sqrt{2}(z^2-1)^{1/4})}}\right)$

01.27.27.2316.01

$$\tanh^{-1}(z) = 2 \cosh^{-1}\left(\frac{\sqrt{z+\sqrt{z^2-1}}}{\sqrt{2}\sqrt[4]{z^2-1}}\right) + \frac{\pi i}{2} /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2317.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\frac{\sqrt{z + \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2318.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\frac{\sqrt{z + \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2319.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\frac{\sqrt{z + \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2320.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\frac{\sqrt{z + \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2321.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + 2i \sqrt{-\frac{i}{z}} \sqrt{-iz} \cosh^{-1} \left(\frac{\sqrt{z + \sqrt{z^2 - 1}}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right)$$

Involving $\tanh^{-1}(z)$ and $\cosh^{-1} \left(\sqrt{\sqrt{z^2 - 1} - z} / (\sqrt{2} (z^2 - 1)^{1/4}) \right)$

01.27.27.2322.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 0) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2323.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2 - 1} - z}}{\sqrt{2} \sqrt[4]{z^2 - 1}} \right) + \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2324.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2} \sqrt[4]{z^2-1}} \right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \quad (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2325.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2} \sqrt[4]{z^2-1}} \right) - \frac{\pi i}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2326.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2} \sqrt[4]{z^2-1}} \right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2327.01

$$\begin{aligned} \tanh^{-1}(z) = & -2i \sqrt{\frac{i}{z}} \sqrt{iz} \cosh^{-1} \left(\frac{\sqrt{\sqrt{z^2-1}-z}}{\sqrt{2} (z^2-1)^{1/4}} \right) + \\ & \frac{\pi i}{2} \left(1 + 2i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right) \end{aligned}$$

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

01.27.27.2328.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right) + \frac{\pi i}{2}; 0 < \arg(z) < \frac{\pi}{2} \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2329.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2}; -\frac{\pi}{2} < \arg(z) < 0 \quad (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2330.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2-1}+z}{2\sqrt{z^2-1}}} \right) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2331.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} + z}{2\sqrt{z^2 - 1}}} \right) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2332.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} + z}{2\sqrt{z^2 - 1}}} \right) + \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2333.01

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

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

01.27.27.2334.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz > 0) \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2335.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) + \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2336.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2337.01

$$\tanh^{-1}(z) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) - \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2338.01

$$\tanh^{-1}(z) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2339.01

$$\begin{aligned} \tanh^{-1}(z) = & -2i \sqrt{\frac{i}{z}} \sqrt{i z} \cosh^{-1} \left(\sqrt{\frac{\sqrt{z^2 - 1} - z}{2\sqrt{z^2 - 1}}} \right) + \\ & \frac{\pi i}{2} \left(1 + 2i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right) \end{aligned}$$

Involving $\tanh^{-1}(\sqrt{z})$

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

01.27.27.2340.01

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

01.27.27.2341.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{1+z}{1-z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2342.01

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

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

01.27.27.2343.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{z+1}{z-1}\right) + \frac{\pi i}{2}; \text{Im}(z) > 0$$

01.27.27.2344.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{z+1}{z-1}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2345.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \cosh^{-1}\left(\frac{z+1}{z-1}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2346.01

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

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

01.27.27.2347.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2348.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) /; -\pi < \arg(z) \leq 0$$

01.27.27.2349.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2350.01

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

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

01.27.27.2351.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{4} /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2352.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2353.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{\pi\sqrt{-z^2}}{4z} /; |z| < 1$$

01.27.27.2354.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{3\pi i}{4} /; |z| > 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.2355.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi i}{4} /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2356.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2357.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi\sqrt{-z^2}}{4z} /; |z| > 1$$

01.27.27.2358.01

$$\begin{aligned} \tanh^{-1}(\sqrt{z}) = & \frac{\pi z}{4\sqrt{-z^2}} \left(1 + \frac{2(z+1)}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) + \\ & \frac{1}{4} \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} + \sqrt{\frac{1}{1+z}} \sqrt{1+z} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) /; |z| \neq 1 \end{aligned}$$

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

01.27.27.2359.01

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

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

01.27.27.2360.01

$$\tanh^{-1}(\sqrt{z}) = \cosh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) /; z \notin (1, \infty)$$

01.27.27.2361.01

$$\tanh^{-1}(\sqrt{z}) = \cosh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2362.01

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

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

01.27.27.2363.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) /; \text{Im}(z) > 0 \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2364.01

$$\tanh^{-1}(\sqrt{z}) = \cosh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) - \frac{\pi i}{2} /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2365.01

$$\tanh^{-1}(\sqrt{z}) = -\cosh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2366.01

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

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

01.27.27.2367.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.2368.01

$$\tanh^{-1}(\sqrt{z}) = \cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.2369.01

$$\tanh^{-1}(\sqrt{z}) = -\cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2370.01

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

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

01.27.27.2371.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.2372.01

$$\tanh^{-1}(\sqrt{z}) = \cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.2373.01

$$\tanh^{-1}(\sqrt{z}) = -\cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2374.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z} + 1} / (\sqrt{2} (1-z)^{1/4})\right)$

01.27.27.2375.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1} \left(\sqrt{\sqrt{1-z} - 1} / (\sqrt{2} (1-z)^{1/4}) \right)$

01.27.27.2376.01

$$\tanh^{-1}(\sqrt{z}) = \pi i + 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} (1-z)^{1/4}} \right); \operatorname{Im}(z) > 0$$

01.27.27.2377.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} (1-z)^{1/4}} \right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.2378.01

$$\tanh^{-1}(\sqrt{z}) = -2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} (1-z)^{1/4}} \right) + \pi i; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2379.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sqrt{z} \sqrt{\frac{1}{z}} \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - 1}}{\sqrt{2} \sqrt[4]{1-z}} \right) - \frac{\pi \sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1} \left(\sqrt{(\sqrt{1-z} + 1) / (2 \sqrt{1-z})} \right)$

01.27.27.2380.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1} \left(\sqrt{(\sqrt{1-z} - 1) / (2 \sqrt{1-z})} \right)$

01.27.27.2381.01

$$\tanh^{-1}(\sqrt{z}) = \pi i + 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{1-z} - 1}}{2 \sqrt{1-z}} \right); \operatorname{Im}(z) > 0$$

01.27.27.2382.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{1-z} - 1}}{2 \sqrt{1-z}} \right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.2383.01

$$\tanh^{-1}(\sqrt{z}) = -2 \cosh^{-1} \left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}} \right) + \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2384.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right)$

01.27.27.2385.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) + \frac{\pi i}{2} /; \text{Im}(z) > 0$$

01.27.27.2386.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.2387.01

$$\tanh^{-1}(\sqrt{z}) = -2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2388.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{2\sqrt{-z^2}} + 2\sqrt{z} \sqrt{\frac{1}{z}} \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right)$

01.27.27.2389.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.2390.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}} \right) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.2391.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1} \left(\frac{\sqrt{\sqrt{1-z} - \sqrt{-z}}}{\sqrt{2} (1-z)^{1/4}} \right) + \frac{\pi \sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1}\left(\sqrt{(\sqrt{1-z} + \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.2392.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2393.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2394.01

$$\tanh^{-1}(\sqrt{z}) = -2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} + \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2395.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\cosh^{-1}\left(\sqrt{(\sqrt{1-z} - \sqrt{-z})/(2\sqrt{1-z})}\right)$

01.27.27.2396.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2397.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2398.01

$$\tanh^{-1}(\sqrt{z}) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2399.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

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

01.27.27.2400.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{1+z}{1-z}\right) - \frac{\pi i}{2} ; \operatorname{Im}(z) \geq 0$$

01.27.27.2401.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{1+z}{1-z}\right) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2402.01

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

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

01.27.27.2403.01

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

01.27.27.2404.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{z+1}{z-1}\right) - \pi i ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2405.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \cosh^{-1}\left(\frac{z+1}{z-1}\right) ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2406.01

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

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

01.27.27.2407.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2408.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2409.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2410.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{1-z}\right) - \frac{\pi i}{4} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2411.01

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

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

01.27.27.2412.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{3\pi i}{4} ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2413.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{3\pi i}{4} ; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.2414.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} - \frac{3i\sqrt{-z^2}}{2z} - 1\right) \frac{\pi i}{2} + \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| < 1$$

01.27.27.2415.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{\pi i}{4} ; |z| > 1 \wedge \text{Im}(z) > 0$$

01.27.27.2416.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) - \frac{\pi i}{4} ; |z| > 1 \wedge \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 0)$$

01.27.27.2417.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) + \frac{\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2418.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi z}{4\sqrt{-z^2}} + \frac{1}{2} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| > 1$$

01.27.27.2419.01

$$\begin{aligned} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = & \frac{\pi}{8} \left(2i \left(-1 + \sqrt{\frac{-1+z}{z}} \sqrt{\frac{z}{-1+z}} + \frac{3iz}{2\sqrt{-z^2}} \right) \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) + \frac{z}{\sqrt{-z^2}} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) + \\ & \frac{1}{4} \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} + \sqrt{\frac{1}{1+z}} \sqrt{1+z} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) \cosh^{-1}\left(\frac{2\sqrt{-z}}{z-1}\right) ; |z| \neq 1 \end{aligned}$$

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

01.27.27.2420.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{1-z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2421.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{1-z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2422.01

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

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

01.27.27.2423.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{1}{1-z}}\right); \operatorname{Im}(z) \geq 0$$

01.27.27.2424.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{1}{1-z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.2425.01

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

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

01.27.27.2426.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cosh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); |\arg(z)| < \pi$$

01.27.27.2427.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\cosh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2428.01

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

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

01.27.27.2429.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); z \notin (-\infty, 1)$$

01.27.27.2430.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2431.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\cosh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2432.01

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

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

01.27.27.2433.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right); z \notin (-\infty, 1)$$

01.27.27.2434.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2435.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{z}{z-1}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2436.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z} + 1} / (\sqrt{2} (1-z)^{1/4})\right)$

01.27.27.2437.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2438.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z} + 1}}{\sqrt{2} \sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2439.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}+1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z}-1}/(\sqrt{2}(1-z)^{1/4})\right)$

01.27.27.2440.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2441.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2442.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2443.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2444.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sqrt{z}\sqrt{\frac{1}{z}} \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-1}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \frac{1}{2}\pi\left(\frac{\sqrt{z-1}}{\sqrt{1-z}} + \frac{2\sqrt{-z^2}}{z}\right)$$

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

01.27.27.2445.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2446.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}+1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2447.01

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

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

01.27.27.2448.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2449.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2450.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2451.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}-1}{2\sqrt{1-z}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2452.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{\sqrt{1-z} + \sqrt{-z}} / (\sqrt{2} (1-z)^{1/4})\right)$

01.27.27.2453.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right); z \notin (-\infty, 1)$$

01.27.27.2454.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2455.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z} + \sqrt{-z}}}{\sqrt{2} \sqrt[4]{1-z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2456.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2}(1-z)^{1/4}}\right)$

01.27.27.2457.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) - \pi i ; 0 < \arg(z) \leq \pi$$

01.27.27.2458.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i + 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2459.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\frac{\sqrt{\sqrt{1-z}-\sqrt{-z}}}{\sqrt{2}\sqrt[4]{1-z}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2460.01

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

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

01.27.27.2461.01

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

01.27.27.2462.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}+\sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2463.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z}+\sqrt{-z}}{2\sqrt{1-z}}}\right) ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2464.01

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

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

01.27.27.2465.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) - \pi i ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2466.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i + 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) ; \operatorname{Im}(z) < 0$$

01.27.27.2467.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \cosh^{-1}\left(\sqrt{\frac{\sqrt{1-z} - \sqrt{-z}}{2\sqrt{1-z}}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2468.01

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

Involving $\tanh^{-1}(\sqrt{1-z})$

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

01.27.27.2469.01

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

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

01.27.27.2470.01

$$\tanh^{-1}(\sqrt{1-z}) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) ; |\arg(z)| < \pi$$

01.27.27.2471.01

$$\tanh^{-1}(\sqrt{1-z}) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2472.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

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

01.27.27.2473.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.2474.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2475.01

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

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

01.27.27.2476.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.27.27.2477.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \leq 0$$

01.27.27.2478.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

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

01.27.27.2479.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.27.27.2480.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2481.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2482.01

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

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

01.27.27.2483.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \text{Im}(z) > 0$$

01.27.27.2484.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.27.27.2485.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2486.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

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

01.27.27.2487.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \cosh^{-1}(\sqrt{z}); |\arg(z)| < \pi$$

01.27.27.2488.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \cosh^{-1}(\sqrt{z}) - \pi i; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.0030.01

$$\text{ArcTanh}\left[\frac{\sqrt{z-1}}{\sqrt{z}}\right] = \cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - 1 \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

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

$$\text{01.27.27.2489.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \cosh^{-1}(\sqrt{z}) ; z \notin (-\infty, 1)$$

$$\text{01.27.27.2490.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \cosh^{-1}(\sqrt{z}) - \pi i ; (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.2491.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\cosh^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.2492.01} \\ \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \left(\sqrt{z} \sqrt{\frac{1}{z} - 1}\right) \frac{\pi i}{2} + \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \cosh^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

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

$$\text{01.27.27.2493.01} \\ \tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \cosh^{-1}(\sqrt{z}) ; |\arg(z)| < \pi$$

$$\text{01.27.27.2494.01} \\ \tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \cosh^{-1}(\sqrt{z}) - \pi i ; (z \in \mathbb{R} \wedge z < 0)$$

$$\text{01.27.27.0029.01} \\ \tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z} - 1}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

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

01.27.27.2495.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \cosh^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; \operatorname{Im}(z) \geq 0$$

01.27.27.2496.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2497.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

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

01.27.27.2498.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \cosh^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2499.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2500.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2501.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

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

01.27.27.2502.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \cosh^{-1}(\sqrt{z}) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2503.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.2504.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\cosh^{-1}(\sqrt{z}) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2505.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

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

01.27.27.2506.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \cosh^{-1}(z) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.2507.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.2508.01

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

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

01.27.27.2509.01

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

01.27.27.2510.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \cosh^{-1}(z) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0032.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

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

01.27.27.2511.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \cosh^{-1}(z) - \frac{\pi i}{2} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2512.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2513.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2514.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \cosh^{-1}(z) - \frac{\pi \sqrt{-z} z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}} \sqrt{\frac{1}{z}}$$

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

01.27.27.2515.01

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

01.27.27.2516.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{1}{2} \cosh^{-1}(z) ; (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2517.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \cosh^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2518.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

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

01.27.27.2519.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \cosh^{-1}(z) - \frac{\pi i}{2} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2520.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2521.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} \cosh^{-1}(z) + \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2522.01

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

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

01.27.27.2523.01

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

01.27.27.2524.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \cosh^{-1}(z) - \pi i ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.0031.01

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

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

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

01.27.27.2525.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \cosh^{-1}\left(\frac{1}{z}\right) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2526.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi i ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2527.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2528.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2529.01

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

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

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

01.27.27.2530.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0$$

01.27.27.2531.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.2532.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2533.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2534.01

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

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

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

01.27.27.2535.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0$$

01.27.27.2536.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2537.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2538.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2539.01

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

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

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

01.27.27.2540.01

$$\tanh^{-1}\left(z \sqrt{\frac{1-z^2}{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0$$

01.27.27.2541.01

$$\tanh^{-1}\left(z \sqrt{\frac{1-z^2}{z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi i; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2542.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2543.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z > 0) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2544.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.2545.01

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

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

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

01.27.27.2546.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) - \frac{\pi i}{2} /; 0 \leq \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2547.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2548.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\cosh^{-1}(z) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2549.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\cosh^{-1}(z) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2550.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\cosh^{-1}(z) + \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2551.01

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

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

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

01.27.27.2552.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) - \frac{\pi i}{2} \text{ ; } 0 \leq \arg(z) < \pi$$

01.27.27.2553.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \cosh^{-1}(z) \text{ ; } \operatorname{Im}(z) < 0$$

01.27.27.2554.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) - \frac{3\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2555.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -\cosh^{-1}(z) + \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2556.01

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

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

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

01.27.27.2557.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \cosh^{-1}(z) - \frac{\pi i}{2} \text{ ; } \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2558.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \cosh^{-1}(z) \ ; \ \text{Im}(z) < 0$$

01.27.27.2559.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \cosh^{-1}(z) - \frac{3\pi i}{2} \ ; \ (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2560.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -\cosh^{-1}(z) + \frac{\pi i}{2} \ ; \ (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2561.01

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

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

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

01.27.27.2562.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \cosh^{-1}(z) - \frac{\pi i}{2} \ ; \ \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2563.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi i}{2} + \cosh^{-1}(z) \ ; \ \text{Im}(z) < 0$$

01.27.27.2564.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \cosh^{-1}(z) - \frac{3\pi i}{2} \ ; \ (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2565.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\cosh^{-1}(z) + \frac{\pi i}{2} \ ; \ (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2566.01

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

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

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

01.27.27.0033.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \cosh^{-1}(z) ; \operatorname{Re}(z) > 0$$

01.27.27.2567.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\cosh^{-1}(z) + \pi i ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2568.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\cosh^{-1}(z) - \pi i ; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2569.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \cosh^{-1}(z) - \pi i ; (i z \in \mathbb{R} \wedge i z < 0) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2570.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\cosh^{-1}(z) ; (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.2571.01

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

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

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

01.27.27.2572.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \cosh^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.2573.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \cosh^{-1}(z) - \pi i /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2574.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \cosh^{-1}(z) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2575.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi i - \cosh^{-1}(z) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2576.01

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

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

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

01.27.27.2577.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \cosh^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2578.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \cosh^{-1}(z) - \pi i /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.2579.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \cosh^{-1}(z) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2580.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\cosh^{-1}(z) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2581.01

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

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

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

01.27.27.2582.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \cosh^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.2583.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \cosh^{-1}(z) - \pi i /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2584.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \cosh^{-1}(z) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2585.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi i - \cosh^{-1}(z) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2586.01

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

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

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

01.27.27.2587.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}(iz) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2588.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = \frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}(iz); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2589.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = -\frac{3\pi i}{4} - \frac{1}{2} \cosh^{-1}(iz); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2590.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}+1}{z}\right) = \frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}(iz); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2591.01

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

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

01.27.27.2592.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}-1}{z}\right) = \frac{1}{2} \cosh^{-1}(iz) - \frac{\pi i}{4}; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2593.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}-1}{z}\right) = -\frac{1}{2} \cosh^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2594.01

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

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

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

01.27.27.2595.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}+1}\right) = \frac{1}{2} \cosh^{-1}(iz) - \frac{\pi i}{4}; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2596.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}+1}\right) = -\frac{1}{2} \cosh^{-1}(iz) - \frac{\pi i}{4}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2597.01

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

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

01.27.27.2598.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{3\pi i}{4} + \frac{1}{2} \cosh^{-1}(iz); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2599.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{4} + \frac{1}{2} \cosh^{-1}(iz); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.2600.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{3\pi i}{4} - \frac{1}{2} \cosh^{-1}(iz); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2601.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{4} - \frac{1}{2} \cosh^{-1}(iz); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.2602.01

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

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

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

01.27.27.2603.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2 \cosh^{-1}\left(\frac{1}{z}\right) - \pi i; |z| > \sqrt{2} \wedge \operatorname{Im}(z) > 0$$

01.27.27.2604.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2 \cosh^{-1}\left(\frac{1}{z}\right) + \pi i ; |z| > \sqrt{2} \wedge \text{Im}(z) < 0$$

01.27.27.2605.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\theta\left(\left|\sqrt{z^2-1}\right|-1\right) + \frac{\sqrt{z^2}}{z} - 1 \right) \pi - \frac{2\sqrt{z-1}\sqrt{z^2}}{\sqrt{\frac{1}{z}-1}z^{3/2}} \cosh^{-1}\left(\frac{1}{z}\right)$$

01.27.27.2606.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \right. \\ & \left. \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \sqrt{\frac{-i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \\ & \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \left(\frac{\pi}{2} - \frac{\sqrt{-1+z}\sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \cosh^{-1}\left(\frac{1}{z}\right) \right) \end{aligned}$$

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

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

01.27.27.2607.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - 2 \cosh^{-1}\left(\frac{1}{z}\right) ; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2608.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - 2 \cosh^{-1}\left(\frac{1}{z}\right) ; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.2609.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{3\pi i}{2} - 2 \cosh^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2610.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{3\pi i}{2} - 2 \cosh^{-1}\left(\frac{1}{z}\right) ; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2611.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = \frac{5\pi i}{2} - 2 \cosh^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2612.01

$$\tanh^{-1}\left(\frac{z^2-2}{2\sqrt{1-z^2}}\right) = -\frac{3\pi i}{2} + 2 \cosh^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2613.01

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

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

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

01.27.27.2614.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i - 2 \cosh^{-1}(z); \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2615.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\pi i + 2 \cosh^{-1}(z); \frac{\pi}{2} < \arg(z) \leq \frac{3\pi}{4}$$

01.27.27.2616.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i + 2 \cosh^{-1}(z); -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2617.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\pi i - 2 \cosh^{-1}(z); -\frac{\pi}{2} < \arg(z) \leq -\frac{\pi}{4}$$

01.27.27.2618.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = & -\frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(\frac{2\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z) + \right. \\ & \left. \frac{\pi}{2} \left(\frac{\sqrt{z^2-1} z}{\sqrt{z^4-z^2}} + \sqrt{\frac{1}{z}} \sqrt{\frac{1}{\sqrt{2} z-1}} \sqrt{\sqrt{2} z-1} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\sqrt{2} z-1} \sqrt{-\frac{1}{\sqrt{2} z+1}} + \frac{\sqrt{z^2}}{z} - 2 \right) \right) \end{aligned}$$

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

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

01.27.27.2619.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2 \cosh^{-1}(z) ; 0 \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.2620.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - 2 \cosh^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2621.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} + 2 \cosh^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2622.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} + 2 \cosh^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2623.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2 \cosh^{-1}(z) ; (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.2624.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2 \cosh^{-1}(z) ; (i z \in \mathbb{R} \wedge i z < 0) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2625.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{5\pi i}{2} + 2 \cosh^{-1}(z) ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2626.01

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

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

Involving \coth^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\coth^{-1}(z)$

01.27.27.2627.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \coth^{-1}(z) \text{ ; } \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2628.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \coth^{-1}(z) \text{ ; } \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0036.01

$$\tanh^{-1}(z) = \coth^{-1}(z) - \frac{\pi \sqrt{-z^2}}{2z} \text{ ; } z \notin (-1, 1)$$

01.27.27.2629.01

$$\tanh^{-1}(z) = \coth^{-1}(z) + \frac{1}{2} (\pi i) \operatorname{sgn}(\operatorname{Im}(z)) \text{ ; } \operatorname{Im}(z) \neq 0$$

01.27.27.0037.02

$$\tanh^{-1}(z) = \frac{1}{2} \pi \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} z + \coth^{-1}(z)$$

Involving $\tanh^{-1}(z)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.0034.01

$$\tanh^{-1}(z) = \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$

Involving $\tanh^{-1}\left(\frac{1}{z}\right)$ and $\coth^{-1}(z)$

01.27.27.2630.01

$$\tanh^{-1}\left(\frac{1}{z}\right) = \coth^{-1}(z)$$

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\coth^{-1}(\sqrt{z})$

01.27.27.2631.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \coth^{-1}(\sqrt{z}) \text{ ; } 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2632.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \coth^{-1}(\sqrt{z}) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2633.01

$$\tanh^{-1}(\sqrt{z}) = \coth^{-1}(\sqrt{z}) + \frac{\sqrt{z-1} \pi}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2634.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2635.01

$$\tanh^{-1}(\sqrt{z}) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) ; |\arg(z)| < \pi$$

01.27.27.2636.01

$$\tanh^{-1}(\sqrt{z}) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2637.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.27.2638.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2639.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2640.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right) ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2641.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.27.27.2642.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2643.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2644.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2645.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2646.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2647.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2648.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2649.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.27.27.2650.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.27.27.2651.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\coth^{-1}\left(1/\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2652.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$ and $\coth^{-1}(z)$

01.27.27.2653.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} + \coth^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2654.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} + \coth^{-1}(z); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2655.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\frac{\pi i}{2} - \coth^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2656.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} - \coth^{-1}(z); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2657.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2658.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = \coth^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2659.01

$$\tanh^{-1}\left(\sqrt{z^2}\right) = -\coth^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2660.01

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

Involving $\tanh^{-1}(a(bz^c)^m)$

Involving $\tanh^{-1}(a(bz^c)^m)$ and $\tanh^{-1}(ab^m z^{mc})$

01.27.27.2661.01

$$\tanh^{-1}(a(bz^c)^m) = \frac{(bz^c)^m}{b^m z^{mc}} \coth^{-1}\left(\frac{1}{a} b^{-m} z^{-mc}\right); 2m \in \mathbb{Z}$$

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

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\coth^{-1}(z)$

01.27.27.2662.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi i + 2 \coth^{-1}(z); |z| < 1 \wedge 0 \leq \arg(z) < \pi$$

01.27.27.2663.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = -\pi i + 2 \coth^{-1}(z); |z| < 1 \wedge -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2664.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \pi \sqrt{-\frac{1}{z^2}} z + 2 \coth^{-1}(z); |z| < 1$$

01.27.16.0004.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2 \coth^{-1}(z); |z| > 1$$

01.27.27.2665.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = \frac{\pi}{2} \left(1 - \frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2}\right) \sqrt{-\frac{1}{z^2}} z + 2 \coth^{-1}(z); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2z}{1+z^2}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2666.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right); |z| < 1$$

01.27.27.2667.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right) - \pi i /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2668.01

$$\tanh^{-1}\left(\frac{2z}{z^2+1}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right) + \pi i /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2669.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{-z^2}}{z} /; |z| > 1$$

01.27.27.2670.01

$$\tanh^{-1}\left(\frac{2z}{1+z^2}\right) = \frac{\pi \sqrt{-z^2}}{2z} \left(\frac{z+i}{z-i} \sqrt{\left(\frac{z-i}{z+i}\right)^2 + 1} \right) + 2 \coth^{-1}\left(\frac{1}{z}\right) /; |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\coth^{-1}(z)$

01.27.27.2671.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \coth^{-1}(z) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2672.01

$$\tanh^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \coth^{-1}(z) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.0035.02

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

Involving $\tanh^{-1}\left(\frac{1+z^2}{2z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2673.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2674.01

$$\tanh^{-1}\left(\frac{1+z^2}{2z}\right) = 2 \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2675.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right)$ and $\coth^{-1}(\sqrt{z})$

01.27.27.2676.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}(\sqrt{z}) + \pi i /; |z| < 1 \wedge \text{Im}(z) \geq 0$$

01.27.27.2677.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}(\sqrt{z}) - \pi i /; |z| < 1 \wedge \text{Im}(z) < 0$$

01.27.27.2678.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}(\sqrt{z}) + \pi \sqrt{-\frac{1}{z}} \sqrt{z} /; |z| < 1$$

01.27.27.2679.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}(\sqrt{z}) /; |z| > 1$$

01.27.27.2680.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right) = \frac{\pi \sqrt{z}}{2} \sqrt{-\frac{1}{z}} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right) + 2 \coth^{-1}(\sqrt{z}) /; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2681.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |z| < 1$$

01.27.27.2682.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2683.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2684.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{-z^2}}{z} /; |z| > 1$$

01.27.27.2685.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = \frac{\pi\sqrt{-z}}{2\sqrt{z}} \left(\frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2 + 1} + 1 \right) + 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{z}}{1+z}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2686.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1 \wedge |\arg(z)| < \pi$$

01.27.27.2687.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = -2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2688.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2\sqrt{z} \sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| < 1$$

01.27.27.2689.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; |z| > 1 \wedge \text{Im}(z) > 0$$

01.27.27.2690.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2691.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = -2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2692.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = 2\sqrt{z} \sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\sqrt{-z^2}}{z}; |z| > 1$$

01.27.27.2693.01

$$\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right) = \frac{\pi\sqrt{-z}}{2\sqrt{z}} \left(\frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2 + 1} + 1 \right) + 2\sqrt{z} \sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); |z| \neq 1$$

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

Involving $\tanh^{-1}\left(\frac{1+z}{2\sqrt{z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.27.27.2694.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}(\sqrt{z}) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2695.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}(\sqrt{z}) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2696.01

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

Involving $\tanh^{-1}\left(\frac{1+z}{2\sqrt{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2697.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2698.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2699.01

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

Involving $\tanh^{-1}\left(\frac{1+z}{2\sqrt{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2700.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2701.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = 2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2702.01

$$\tanh^{-1}\left(\frac{z+1}{2\sqrt{z}}\right) = -2 \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2703.01

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

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} + cz\right)$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} + z\right)$ and $\coth^{-1}(z)$

01.27.27.2704.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{\pi i}{2} + \frac{1}{2} \coth^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2705.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{1}{2} \coth^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2706.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = -\frac{\pi i}{2} + \frac{1}{2} \coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2707.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{\pi \sqrt{z - 1}}{4 \sqrt{1 - z}} \left(z + \sqrt{z^2}\right) + \frac{1}{2} \coth^{-1}(z)$$

Involving $\tanh^{-1}\left(\sqrt{z^2 - 1} + \frac{1}{z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2708.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2709.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < -1) \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2710.01

$$\tanh^{-1}\left(z + \sqrt{z^2 - 1}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{z^2 - 1}}{4 \sqrt{1 - z^2}}$$

Involving $\tanh^{-1}\left(\sqrt{1 + z^2} - z\right)$ and $\coth^{-1}(z)$

01.27.27.2711.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{1}{2} \coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2712.01

$$\tanh^{-1}\left(\sqrt{z^2 - 1} - z\right) = -\frac{\pi i}{2} - \frac{1}{2} \coth^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2713.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=\frac{\pi i}{2}-\frac{1}{2}\coth^{-1}(z) ; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2714.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=\frac{\pi\sqrt{-z-1}\left(z-\sqrt{z^2}\right)}{4\sqrt{z+1}z}-\frac{1}{2}\coth^{-1}(z)$$

Involving $\tanh^{-1}\left(\sqrt{z^2-1}-z\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2715.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=-\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4} ; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2716.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=-\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4} ; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < -1) \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2717.01

$$\tanh^{-1}\left(\sqrt{z^2-1}-z\right)=-\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right)+\frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1+z}}\right)$ and $\coth^{-1}(z)$

01.27.27.2718.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1+z}}\right)=\frac{1}{2}\coth^{-1}(z) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2719.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1+z}}\right)=\frac{\pi i}{2}+\frac{1}{2}\coth^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2720.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1+z}}\right)=-\frac{\pi i}{2}+\frac{1}{2}\coth^{-1}(z) ; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2721.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1+z}}\right)=-\frac{\pi\sqrt{-z-1}\left(z-\sqrt{z^2}\right)}{4\sqrt{z+1}z}+\frac{1}{2}\coth^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2722.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2723.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} ; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2724.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}+z}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{z^2-1}}{4 \sqrt{1-z^2}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\coth^{-1}(z)$

01.27.27.2725.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi i}{2} - \frac{1}{2} \coth^{-1}(z) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2726.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \coth^{-1}(z) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2727.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = \frac{\pi i}{2} - \frac{1}{2} \coth^{-1}(z) ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2728.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{\pi \sqrt{z-1}}{4 \sqrt{1-z} z} \left(z + \sqrt{z^2}\right) - \frac{1}{2} \coth^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2729.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2730.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2731.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2-1}-z}\right) = -\frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{z^2-1}}{4 \sqrt{1-z^2}}$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\coth^{-1}(z)$

01.27.27.2732.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \coth^{-1}(z) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2733.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \coth^{-1}(z) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2734.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{1}{2} \coth^{-1}(z) - \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2735.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = -\frac{\pi i}{2} + \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2736.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}+1}{z}\right) = \frac{\pi i}{2} + \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2737.01

$$\tanh^{-1}\left(\frac{1+\sqrt{1-z^2}}{z}\right) = \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\coth^{-1}(z)$

01.27.27.2738.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2739.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2740.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}-1}{z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2741.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right)$ and $\coth^{-1}(z)$

01.27.27.2742.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2743.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2744.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi z \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}+1}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2745.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right)$ and $\coth^{-1}(z)$

01.27.27.2746.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2} \coth^{-1}(z) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2747.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2} \coth^{-1}(z) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2748.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2} \coth^{-1}(z) + \frac{\pi z \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.27.27.2749.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = \frac{\pi i}{2} - \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2750.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{\pi i}{2} - \frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2751.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1-z^2}-1}\right) = -\frac{1}{2} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}}$$

Involving csch^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$

01.27.27.2752.01

$$\tanh^{-1}(z) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right); |z| < 1$$

01.27.27.2753.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2754.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2755.01

$$\tanh^{-1}(z) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) - \frac{\pi \sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.2756.01

$$\tanh^{-1}(z) = \frac{1-iz}{2(1+iz)} \sqrt{\frac{(iz+1)^2}{(iz-1)^2}} \operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) - \frac{\pi \sqrt{-z^2}}{4z} \left(1 - \frac{1-iz}{1+iz} \sqrt{\frac{(iz+1)^2}{(iz-1)^2}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right)$

01.27.27.2757.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2758.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2759.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2760.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2761.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \frac{i\sqrt{-z^2}}{z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + \frac{i\sqrt{-z^2} \sqrt{1-z^2}}{2z} \sqrt{\frac{1}{1-z^2}} \operatorname{csch}^{-1}\left(\frac{i(1-z^2)}{1+z^2}\right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{i(z^2-1)}{z^2+1}\right)$

01.27.27.2762.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z^2-1)}{z^2+1}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2763.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z^2-1)}{z^2+1}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2764.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z^2-1)}{z^2+1}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2765.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z^2-1)}{z^2+1}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2766.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$

01.27.27.2767.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) + \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2768.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2769.01

$$\tanh^{-1}(z) = -\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2770.01

$$\tanh^{-1}(z) = -\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.0040.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

01.27.27.2771.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.27.27.2772.01

$$\tanh^{-1}(z) = \pi i - \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2773.01

$$\tanh^{-1}(z) = -\pi i - \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2774.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

01.27.27.2775.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2776.01

$$\tanh^{-1}(z) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2777.01

$$\tanh^{-1}(z) = \pi i + \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2778.01

$$\tanh^{-1}(z) = -\pi i - \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2779.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

01.27.27.2780.01

$$\tanh^{-1}(z) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2781.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2782.01

$$\tanh^{-1}(z) = \pi i - \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2783.01

$$\tanh^{-1}(z) = -\pi i + \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2784.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

01.27.27.2785.01

$$\tanh^{-1}(z) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2786.01

$$\tanh^{-1}(z) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2787.01

$$\tanh^{-1}(z) = \pi i + \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2788.01

$$\tanh^{-1}(z) = -\pi i - \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2789.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{-\sqrt{1-z^2}-1} \right)$

01.27.27.2790.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{-\sqrt{1-z^2}-1}} \right) + \pi i /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2791.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{-\sqrt{1-z^2}-1}} \right) - \pi i /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2792.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{-\sqrt{1-z^2}-1}} \right) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2793.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{-\sqrt{1-z^2}-1}} \right) - \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2794.01

$$\tanh^{-1}(z) = -\frac{2\sqrt{-z}\sqrt{z^2-1}}{\sqrt{z}\sqrt{1-z^2}} \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{-\sqrt{1-z^2}-1}} \right) - \frac{\pi\sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{1-\sqrt{1-z^2}} \right)$

01.27.27.2795.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}} \right) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.2796.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}} \right) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.2797.01

$$\tanh^{-1}(z) = \frac{2\sqrt{z^2}}{z} \operatorname{csch}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\sqrt{-2\sqrt{1-z^2}} / (\sqrt{1-z^2} + 1) \right)$

01.27.27.2798.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) + \pi i ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2799.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) - \pi i ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2800.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) + \pi i ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2801.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) - \pi i ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2802.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right)$

01.27.27.2803.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.2804.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.2805.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{-\sqrt{z^2-1}-z}}\right)$

01.27.27.2806.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{-\sqrt{z^2-1}-z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2807.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{-\sqrt{z^2-1}-z}}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2808.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{-\sqrt{z^2-1}-z}}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2809.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} + i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \right) - 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{-\sqrt{z^2-1}-z}}\right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right)$

01.27.27.2810.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.2811.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2812.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2813.01

$$\tanh^{-1}(z) = 2\sqrt{z+1}\sqrt{\frac{1}{z+1}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) + \left(1-i\sqrt{z^2}\sqrt{-\frac{1}{z^2}}\sqrt{1-z}\sqrt{\frac{1}{1-z}} - \sqrt{1+z}\sqrt{\frac{1}{1+z}}\right)\frac{\pi i}{2}$$

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\sqrt{z^2-1}}}{\sqrt{\sqrt{z^2-1}+z}}\right)$

01.27.27.2814.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2\sqrt{z^2-1}}}{\sqrt{\sqrt{z^2-1}+z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2815.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2\sqrt{z^2-1}}}{\sqrt{\sqrt{z^2-1}+z}}\right) + \frac{\pi i}{2}; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.2816.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2\sqrt{z^2-1}}}{\sqrt{\sqrt{z^2-1}+z}}\right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2817.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}} \right) - \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.2818.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}+z}} \right) - \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2819.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right)$

01.27.27.2820.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.2821.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right) - \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2822.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.2823.01

$$\tanh^{-1}(z) = -2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right) + \frac{\pi i}{2} ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2824.01

$$\tanh^{-1}(z) = 2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2825.01

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

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right)$

01.27.27.2826.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right) + \frac{\pi i}{4}; 0 < \arg(z) \leq \pi$$

01.27.27.2827.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right) - \frac{\pi i}{4}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2828.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2829.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) + \frac{i\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right)$

01.27.27.2830.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) + \frac{\pi i}{4}; 0 < \arg(z) \leq \pi$$

01.27.27.2831.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) - \frac{\pi i}{4}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2832.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2833.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} + \frac{i\sqrt{-z}}{\sqrt{z}} - 1 \right) - \frac{i\sqrt{-z} \sqrt{1-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right)$

01.27.27.2834.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right); |z| < 1$$

01.27.27.2835.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2836.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} - \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2837.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) - \frac{\pi\sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.2838.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2}\right) + \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right)$

01.27.27.2839.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right); |z| < 1$$

01.27.27.2840.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right); |z| > 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.2841.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.2842.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) - \frac{\pi\sqrt{-z^2}}{2z}; |z| > 1$$

01.27.27.2843.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi\sqrt{-z^2}}{4z} \left(1 - \frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2}\right) - \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right); |z| \neq 1$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}(\sqrt{z-1})$

01.27.27.2844.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}(\sqrt{z-1}) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2845.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}(\sqrt{z-1}) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2846.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{csch}^{-1}(\sqrt{z-1}) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2847.01

$$\tanh^{-1}(\sqrt{z}) = \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \operatorname{csch}^{-1}(\sqrt{z-1}) - \frac{\pi \sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

01.27.27.2848.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right); z \notin (1, \infty)$$

01.27.27.2849.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2850.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

01.27.27.2851.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right); z \notin (0, \infty)$$

01.27.27.2852.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2853.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2854.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

01.27.27.2855.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right); z \notin (-\infty, 0) \wedge z \notin (1, \infty)$$

01.27.27.2856.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2857.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2858.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{-\sqrt{1-z} - 1}\right)$

01.27.27.2859.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - 1}}\right) + \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.2860.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - 1}}\right) - \pi i; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2861.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - 1}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2862.01

$$\tanh^{-1}(\sqrt{z}) = -2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - 1}}\right) - \frac{\pi \sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{1 - \sqrt{1-z}}\right)$

01.27.27.2863.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{1 - \sqrt{1-z}}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} + 1)\right)$

01.27.27.2864.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}} \right) + \pi i /; 0 < \arg(z) \leq \pi$$

01.27.27.2865.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}} \right) - \pi i /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2866.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1} \left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}} \right) - \pi i /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2867.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1} \left(\sqrt{2\sqrt{1-z}/(1-\sqrt{1-z})} \right)$

01.27.27.2868.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{1-\sqrt{1-z}}} \right) /; |\arg(z)| < \pi$$

01.27.27.2869.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{1-\sqrt{1-z}}} \right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2870.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1} \left(\sqrt{2(1-z)^{1/4}/\sqrt{-\sqrt{1-z}-\sqrt{-z}}} \right)$

01.27.27.2871.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-\sqrt{-z}}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.2872.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1} \left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-\sqrt{-z}}} \right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2873.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - \sqrt{-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2874.01

$$\tanh^{-1}(\sqrt{z}) = 2\sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{-\sqrt{1-z} - \sqrt{-z}}}\right) + \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{i\sqrt{-z^2}}{2z} - 1\right)\pi i$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right)$

01.27.27.2875.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2876.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2877.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2878.01

$$\tanh^{-1}(\sqrt{z}) = 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\sqrt{1-z}}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right)$

01.27.27.2879.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.2880.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2881.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2882.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2883.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{-z} - \sqrt{1-z})}\right)$

01.27.27.2884.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{-z} - \sqrt{1-z}}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2885.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{-z} - \sqrt{1-z}}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.2886.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right)$

01.27.27.2887.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{z+1}\right) - \frac{\pi i}{4}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2888.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0$$

01.27.27.2889.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2890.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i \sqrt{z} \sqrt{-\frac{1}{z} - 1}\right) + \frac{i \sqrt{1-z} \sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{i(1-z)}{1+z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right)$

01.27.27.2891.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) - \frac{\pi i}{4} \quad ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2892.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) + \frac{\pi i}{4} \quad ; \operatorname{Im}(z) < 0$$

01.27.27.2893.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right) - \frac{3\pi i}{4} \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2894.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{4} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + i \sqrt{z} \sqrt{-\frac{1}{z} - 1} \right) - \frac{i \sqrt{1-z} \sqrt{-z^2}}{2z} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{i(z-1)}{z+1}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right)$

01.27.27.2895.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) - \frac{\pi i}{2} \quad ; |z| < 1 \wedge \operatorname{Im}(z) \geq 0$$

01.27.27.2896.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) + \frac{\pi i}{2} \quad ; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.2897.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) - \frac{1}{2} (\pi \sqrt{z}) \sqrt{-\frac{1}{z}} \quad ; |z| < 1$$

01.27.27.2898.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) \quad ; |z| > 1$$

01.27.27.2899.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi \sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} + 1 \right) + \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csch}^{-1}\left(\frac{1-z}{2\sqrt{z}}\right) \quad ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right)$

01.27.27.2900.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) - \frac{\pi i}{2} \quad ; |z| < 1 \wedge \operatorname{Im}(z) \geq 0$$

01.27.27.2901.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) + \frac{\pi i}{2} ; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.2902.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) - \frac{1}{2} (\pi \sqrt{z}) \sqrt{-\frac{1}{z}} ; |z| < 1$$

01.27.27.2903.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) ; |z| > 1$$

01.27.27.2904.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi \sqrt{z}}{4} \sqrt{-\frac{1}{z}} \left(\frac{1+z}{1-z} \sqrt{\left(\frac{1-z}{1+z}\right)^2 + 1} \right) - \frac{1+z}{2(1-z)} \sqrt{\left(\frac{1-z}{1+z}\right)^2} \operatorname{csch}^{-1}\left(\frac{z-1}{2\sqrt{z}}\right) ; |z| \neq 1$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z-1})$

01.27.27.2905.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}(\sqrt{z-1}) ; z \notin (0, 1)$$

01.27.27.2906.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{csch}^{-1}(\sqrt{z-1}) - \pi i ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2907.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

01.27.27.2908.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2909.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) + \frac{\pi i}{2} ; \operatorname{Im}(z) < 0$$

01.27.27.2910.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) - \frac{\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2911.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

01.27.27.2912.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.2913.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.2914.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z > 0)$$

01.27.27.2915.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

01.27.27.2916.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2917.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.27.27.2918.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2919.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{-\sqrt{1-z}-1}\right)$

01.27.27.2920.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2921.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2922.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2923.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-1}}\right) - \pi \left(\frac{\sqrt{z-1}}{2\sqrt{1-z}} + \frac{\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{1-\sqrt{1-z}}}\right)$

01.27.27.2924.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{1-\sqrt{1-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2925.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{1-\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2926.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{1-\sqrt{1-z}}}\right) - \frac{\pi \sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{-2\sqrt{1-z}/(\sqrt{1-z}+1)}\right)$

01.27.27.2927.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) + \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.2928.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2929.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2930.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z}/(1-\sqrt{1-z})}\right)$

01.27.27.2931.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{1-\sqrt{1-z}}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2932.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{1-\sqrt{1-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2933.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{1-\sqrt{1-z}}}\right) - \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2934.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{2(1-z)^{1/4}/\sqrt{-\sqrt{1-z}-\sqrt{-z}}}\right)$

01.27.27.2935.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.2936.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}\right) + \pi i; \operatorname{Im}(z) < 0$$

01.27.27.2937.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{-\sqrt{1-z}-\sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2938.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{-\sqrt{1-z} - \sqrt{-z}}}\right) - \pi i ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.2939.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(1 + 2i \sqrt{z} \sqrt{-\frac{1}{z}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{-\sqrt{1-z} - \sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right)$

01.27.27.2940.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) ; z \notin (-\infty, 1)$$

01.27.27.2941.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) - \pi i ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2942.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right) ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2943.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} - 1\right) \frac{\pi i}{2} + 2 \sqrt{\frac{1}{z}} \sqrt{z} \operatorname{csch}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{-z} - \sqrt{1-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{2 \sqrt{1-z} / (\sqrt{1-z} + \sqrt{-z})}\right)$

01.27.27.2944.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2 \sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \pi i ; \operatorname{Im}(z) > 0$$

01.27.27.2945.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2 \sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) + \pi i ; \operatorname{Im}(z) < 0$$

01.27.27.2946.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{-\frac{2 \sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2947.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z} + \sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2948.01

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{-z} - \sqrt{1-z})}\right)$

01.27.27.2949.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{-z} - \sqrt{1-z}}}\right); z \notin (0, 1)$$

01.27.27.2950.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{-z} - \sqrt{1-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.2951.01

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

Involving $\tanh^{-1}(\sqrt{1+z})$

Involving $\tanh^{-1}(\sqrt{1+z})$ and $\operatorname{csch}^{-1}(\sqrt{z})$

01.27.27.2952.01

$$\tanh^{-1}(\sqrt{1+z}) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2953.01

$$\tanh^{-1}(\sqrt{z+1}) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.27.27.2954.01

$$\tanh^{-1}(\sqrt{1+z}) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2955.01

$$\tanh^{-1}(\sqrt{1+z}) = -\frac{\sqrt{-z-1}\sqrt{-z}}{\sqrt{z+1}\sqrt{z}}\operatorname{csch}^{-1}(\sqrt{z}) - \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z})$

$$\text{01.27.27.2956.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = \operatorname{csch}^{-1}(\sqrt{z}) ; z \notin (-1, 0)$$

$$\text{01.27.27.2957.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = -\operatorname{csch}^{-1}(\sqrt{z}) - \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

$$\text{01.27.27.2958.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1+z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} - 1 \right) + \frac{\sqrt{z} \sqrt{-z-1}}{\sqrt{-z} \sqrt{z+1}} \operatorname{csch}^{-1}(\sqrt{z})$$

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z})$

$$\text{01.27.27.2959.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \operatorname{csch}^{-1}(\sqrt{z}) ; |\arg(z)| < \pi$$

$$\text{01.27.27.2960.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = -\operatorname{csch}^{-1}(\sqrt{z}) - \pi i ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

$$\text{01.27.27.2961.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = -\operatorname{csch}^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge z < -1)$$

$$\text{01.27.27.2962.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} - 1 \right) + \frac{\sqrt{z} \sqrt{-1-z}}{\sqrt{-z}} \sqrt{\frac{1}{1+z}} \operatorname{csch}^{-1}(\sqrt{z})$$

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2963.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) \geq 0$$

01.27.27.2964.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.2965.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2966.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 \leq \arg(z) < \pi$$

01.27.27.2967.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.2968.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.2969.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2970.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2971.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.27.27.2972.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2973.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2974.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 \leq \arg(z) < \pi$$

01.27.27.2975.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2976.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2977.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2978.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2979.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.2980.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2981.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2982.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.27.27.2983.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2984.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2985.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2986.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, -1)$$

01.27.27.2987.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2988.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2989.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.27.27.2990.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2991.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2992.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.2993.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.27.27.2994.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2995.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.2996.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.2997.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-\infty, -1)$$

01.27.27.2998.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.2999.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3000.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, -1)$$

01.27.27.3001.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3002.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3003.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.27.27.3004.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3005.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3006.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3007.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3008.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0$$

01.27.27.3009.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3010.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3011.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3012.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3013.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3014.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3015.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3016.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3017.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3018.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-z-1}}{2\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3019.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} ; \operatorname{Im}(z) > 0$$

01.27.27.3020.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.27.27.3021.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3022.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{\pi i}{4} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} + i\sqrt{-z} \sqrt{\frac{1}{z}} - 1 \right) + \frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \operatorname{csch}^{-1}\left(\frac{i}{z}\right)$$

01.27.27.3023.01

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3024.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3025.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3026.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3027.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{i\sqrt{-z-1}}{2\sqrt{z+1}} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{2} \left(\frac{\sqrt{-z} z \sqrt{-1+z^2}}{\sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}} + \frac{\sqrt{-1-z}}{2\sqrt{1+z}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3028.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3029.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = -\frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3030.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3031.01

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

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

Involving $\tanh^{-1}\left(\sqrt{1+z^2}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3032.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \operatorname{csch}^{-1}(z) + \frac{\pi i}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3033.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \operatorname{csch}^{-1}(z) - \frac{\pi i}{2}; -\frac{\pi}{2} < \arg(z) \leq 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3034.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = -\operatorname{csch}^{-1}(z) - \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) \leq \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3035.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = -\operatorname{csch}^{-1}(z) + \frac{\pi i}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3036.01

$$\tanh^{-1}\left(\sqrt{1+z^2}\right) = \frac{z\sqrt{-z^2-1}}{\sqrt{-z^4-z^2}} \operatorname{csch}^{-1}(z) + \frac{\pi\sqrt{z^2+1}}{2\sqrt{-z^2-1}}$$

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

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3037.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = \operatorname{csch}^{-1}(z); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3038.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = -\operatorname{csch}^{-1}(z); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3039.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = -\operatorname{csch}^{-1}(z) - \pi i; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3040.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) = \operatorname{csch}^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.0038.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2}}{z} \operatorname{csch}^{-1}(z) /; \operatorname{Re}(z) \neq 0$$

01.27.27.3041.01

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

01.27.27.0039.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3042.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \operatorname{csch}^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3043.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = -\operatorname{csch}^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3044.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = -\operatorname{csch}^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3045.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \operatorname{csch}^{-1}(z) - \pi i /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3046.01

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

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

Involving $\tanh^{-1}\left(z\sqrt{\frac{1+z^2}{z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3047.01

$$\tanh^{-1}\left(z\sqrt{\frac{1+z^2}{z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \ ; \ -\pi < \arg(z) \leq 0$$

01.27.27.3048.01

$$\tanh^{-1}\left(z\sqrt{\frac{1+z^2}{z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \ ; \ 0 < \arg(z) \leq \pi$$

01.27.27.3049.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3050.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \ ; \ iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.27.27.3051.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i \ ; \ (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3052.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \pi i \ ; \ (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.3053.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3054.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3055.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3056.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3057.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3058.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3059.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3060.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3061.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3062.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3063.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} \left(\sqrt{1+z^2} \sqrt{\frac{1}{1+z^2} - 1} \right) + \frac{\sqrt{-z^2-z^4}}{z \sqrt{-1-z^2}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3064.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3065.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3066.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3067.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3068.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3069.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.3070.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3071.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3072.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3073.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3074.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3075.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3076.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3077.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3078.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.27.27.3079.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.3080.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.3081.01

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

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

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3082.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3083.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3084.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3085.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3086.01

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

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+1}}{z}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3087.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.3088.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3089.01

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

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2-1}}{z}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3090.01

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

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}+1}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3091.01

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

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3092.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = -\frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \pi$$

01.27.27.3093.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi i}{2} + \frac{1}{2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3094.01

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

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

Involving $\tanh^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3095.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = 2 \operatorname{csch}^{-1}(z); |z| > \sqrt{2} \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3096.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = -2 \operatorname{csch}^{-1}(z); |z| > \sqrt{2} \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.27.27.3097.01

$$\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = \frac{\sqrt{z^2+1}}{\sqrt{-z^2-1}} \left(\frac{2\sqrt{-z^2}}{z} \operatorname{csch}^{-1}(z) - \left(\theta\left(\left|\sqrt{-z^2-1}\right|-1\right) - 1 \right) \pi \right)$$

01.27.27.3098.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right) = & \frac{\pi}{2\sqrt{z^2+1}} \left(-iz \sqrt{1 + \frac{1}{z^2}} \left(i \sqrt{-\frac{1}{z^2}} z + \sqrt{\frac{1}{z}} \sqrt{z} - \sqrt{\frac{z}{i+z}} \sqrt{\frac{i+z}{z}} - \sqrt{-\frac{1}{z}} \sqrt{-z} + \sqrt{\frac{-i+z}{z}} \sqrt{\frac{z}{-i+z}} \right) - \right. \\ & \left. (z^2+2) \sqrt{-\frac{z^2+1}{z^4}} \sqrt{-\frac{z^4}{z^2+1}} \sqrt{-\frac{z^2+1}{(z^2+2)^2}} \right) + \frac{2z}{\sqrt{z^2+1}} \sqrt{1 + \frac{1}{z^2}} \operatorname{csch}^{-1}(z) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.27.27.3099.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + 2 \operatorname{csch}^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3100.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + 2 \operatorname{csch}^{-1}(z) ; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.3101.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} - 2 \operatorname{csch}^{-1}(z) ; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.3102.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = \frac{\pi i}{2} - 2 \operatorname{csch}^{-1}(z) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.27.27.3103.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} - 2 \operatorname{csch}^{-1}(z) ; (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.3104.01

$$\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} + 2 \operatorname{csch}^{-1}(z) ; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.27.27.3105.01

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

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

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{1+2z^2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3106.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right) = 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right) ; -\frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{3\pi}{4}$$

01.27.27.3107.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2z\sqrt{z^2+1}}{2z^2+1}\right) = & \frac{\pi i}{2} \left(-\frac{i\sqrt{-z^2}}{z} + \sqrt{\frac{i}{z}} \sqrt{i z} \sqrt{\frac{1}{i\sqrt{2}z-1}} \sqrt{i\sqrt{2}z-1} - \right. \\ & \left. \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{-i\sqrt{2}z-1} \sqrt{-\frac{1}{\sqrt{2}iz+1}} + \frac{iz\sqrt{-z^2-1}}{\sqrt{z^4+z^2}} \right) + 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \end{aligned}$$

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

Involving $\tanh^{-1}\left(\frac{1+2z^2}{2z\sqrt{z^2+1}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3108.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right) ; 0 \leq \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3109.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3110.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = -\frac{3\pi i}{2} + 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3111.01

$$\tanh^{-1}\left(\frac{2z^2+1}{2z\sqrt{z^2+1}}\right) = \frac{3\pi i}{2} + 2 \operatorname{csch}^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3112.01

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

Involving sech^{-1}

Involving $\tanh^{-1}(z)$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right)$

01.27.27.3113.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| < 1 \wedge \operatorname{Re}(z) > 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3114.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| > 1 \wedge -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.3115.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| < 1 \wedge \operatorname{Re}(z) \leq 0 \vee \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.3116.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| > 1 \wedge -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3117.01

$$\tanh^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \sqrt{-\frac{i}{z}} \sqrt{-iz} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| < 1 \vee 0 < \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) \leq \pi$$

01.27.27.3118.01

$$\tanh^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} i \sqrt{\frac{i}{z}} \sqrt{iz} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right); |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.3497.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(\frac{z}{\sqrt{-z^2}} + \frac{(1-i)z(z-i\sqrt{-z^2})}{z(-i+z)} \sqrt{\frac{(-i+z)^2}{(i+z)^2}} \right) + \frac{1}{2} i \sqrt{\frac{i+z}{z}} \sqrt{z(-i+z)} \sqrt{\frac{1}{z^2+1}} \operatorname{sech}^{-1}\left(\frac{i(1-z^2)}{2z}\right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right)$

01.27.27.3119.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right); |z| < 1 \wedge \operatorname{Re}(z) \geq 0 \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.3120.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right); |z| > 1 \wedge 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.3121.01

$$\tanh^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right); |z| < 1 \wedge \operatorname{Re}(z) < 0 \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.27.27.3122.01

$$\tanh^{-1}(z) = \frac{3\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right); |z| > 1 \wedge \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.3123.01

$$\tanh^{-1}(z) = \frac{\pi}{4} \left(-\frac{\sqrt{-z^2}}{z} + \frac{i+z}{i-z} \sqrt{\left(\frac{z-i}{z+i}\right)^2 \left(\frac{\sqrt{-z^2}}{z} - i\right)} \right) - \frac{1}{2} i \sqrt{\frac{i-z}{z}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+iz} \operatorname{sech}^{-1}\left(\frac{i(z^2-1)}{2z}\right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{1-z^2}{1+z^2}\right)$

01.27.27.3124.01

$$\tanh^{-1}(z) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z^2}{1+z^2}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3125.01

$$\tanh^{-1}(z) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z^2}{1+z^2}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3126.01

$$\tanh^{-1}(z) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z^2}{1+z^2}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3127.01

$$\tanh^{-1}(z) = \pi i - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z^2}{1+z^2}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3128.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z^2-1}{z^2+1}\right)$

01.27.27.3129.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z^2-1}{z^2+1}\right); 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.3130.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z^2-1}{z^2+1}\right); -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.27.27.3131.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z^2-1}{z^2+1}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.3132.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z^2-1}{z^2+1}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3133.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{1-z^2}\right)$

01.27.27.3134.01

$$\tanh^{-1}(z) = \operatorname{sech}^{-1}\left(\sqrt{1-z^2}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3135.01

$$\tanh^{-1}(z) = -\operatorname{sech}^{-1}\left(\sqrt{1-z^2}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3136.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

01.27.27.3137.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3138.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3139.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3140.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.3141.01

$$\tanh^{-1}(z) = \frac{3\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3142.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

01.27.27.3143.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3144.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3145.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3146.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3147.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

01.27.27.3148.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; 0 < \arg[z] < \frac{\pi}{2}$$

01.27.27.3149.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.3150.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.3151.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3152.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

01.27.27.3153.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) /; 0 < \arg[z] < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3154.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) /; -\frac{\pi}{2} \leq \arg[z] < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3155.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3156.01

$$\tanh^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3157.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{2}(1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2} + 1}\right)$

01.27.27.3158.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}}\right) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3159.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}}\right) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3160.01

$$\tanh^{-1}(z) = \frac{2\sqrt{z^2}}{z} \operatorname{sech}^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} + 1}}\right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{2}(1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2} - 1}\right)$

01.27.27.3161.01

$$\tanh^{-1}(z) = \pi i + 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}(1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2} - 1}}\right) ; 0 < \arg(z) < \frac{\pi}{2}$$

01.27.27.3162.01

$$\tanh^{-1}(z) = -\pi i + 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}} \right) ; -\frac{\pi}{2} \leq \arg[z] \leq 0$$

01.27.27.3163.01

$$\tanh^{-1}(z) = \pi i - 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}} \right) ; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.3164.01

$$\tanh^{-1}(z) = -\pi i - 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}} \right) ; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3165.01

$$\tanh^{-1}(z) = 2 \sqrt{\frac{1}{z^2}} z \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z^2)^{1/4}}{\sqrt{\sqrt{1-z^2}-1}} \right) + \frac{\pi \sqrt{z}}{\sqrt{-z}}$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\sqrt{2 \sqrt{1-z^2}} / (\sqrt{1-z^2} + 1) \right)$

01.27.27.3166.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3167.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{1-z^2}}{\sqrt{1-z^2} + 1}} \right) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3168.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\sqrt{2 \sqrt{1-z^2}} / (\sqrt{1-z^2} - 1) \right)$

01.27.27.3169.01

$$\tanh^{-1}(z) = \pi i + 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}} \right) ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3170.01

$$\tanh^{-1}(z) = -\pi i + 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}} \right) ; -\frac{\pi}{2} \leq \arg[z] < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3171.01

$$\tanh^{-1}(z) = \pi i - 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}} \right) ; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3172.01

$$\tanh^{-1}(z) = -\pi i - 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}} \right) ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3173.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\sqrt{2} (z^2 - 1)^{1/4} / \left(\sqrt{\sqrt{z^2 - 1} + z} \right) \right)$

01.27.27.3174.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3175.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3176.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3177.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3178.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right) + \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3179.01

$$\tanh^{-1}(z) = \frac{\pi i}{2} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + 2i \sqrt{-\frac{i}{z}} \sqrt{-iz} \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} + z}} \right)$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right)$

01.27.27.3180.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) - \frac{\pi i}{2} ; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz > 0) \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3181.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3182.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3183.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) - \frac{\pi i}{2} ; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3184.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) - \frac{3\pi i}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3185.01

$$\begin{aligned} \tanh^{-1}(z) = & -2i \sqrt{\frac{i}{z}} \sqrt{iz} \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) + \\ & \frac{\pi i}{2} \left(1 + 2i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right) \end{aligned}$$

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\sqrt{2 \sqrt{z^2 - 1}} / (\sqrt{z^2 - 1} + z) \right)$

01.27.27.3186.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} ; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3187.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3188.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) - \frac{\pi i}{2} ; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3189.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2 \sqrt{z^2 - 1}}{\sqrt{z^2 - 1} + z}} \right) + \frac{\pi i}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (iz \in \mathbb{R} \wedge iz < 0)$$

01.27.27.3190.01

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

Involving $\tanh^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right)$

01.27.27.3191.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 0) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3192.01

$$\tanh^{-1}(z) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) + \frac{\pi i}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3193.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3194.01

$$\tanh^{-1}(z) = -2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3195.01

$$\begin{aligned} \tanh^{-1}(z) = & -2i \sqrt{\frac{i}{z}} \sqrt{i z} \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) + \\ & \frac{\pi i}{2} \left(2 + 2i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - i \sqrt{z^2} \sqrt{-\frac{1}{z^2}} - \sqrt{1-z} \sqrt{\frac{1}{1-z}} - \sqrt{1+z} \sqrt{\frac{1}{1+z}} \right) \end{aligned}$$

Involving $\tanh^{-1}(\sqrt{z})$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.3196.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right); z \notin (1, \infty)$$

01.27.27.3197.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right) - \pi i; (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3198.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.3199.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.27.27.3200.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.3201.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3202.01

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

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.3203.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3204.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) /; -\pi < \arg(z) \leq 0$$

01.27.27.3205.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3206.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{4\sqrt{-z^2}} + \frac{1}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.3207.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{4} /; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.3208.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| < 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.3209.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{\pi\sqrt{-z^2}}{4z}; |z| < 1$$

01.27.27.3210.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{3\pi i}{4}; |z| > 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.3211.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi i}{4}; |z| > 1 \wedge -\pi < \arg(z) \leq 0$$

01.27.27.3212.01

$$\tanh^{-1}(\sqrt{z}) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{3\pi i}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3213.01

$$\tanh^{-1}(\sqrt{z}) = \frac{1}{2} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi\sqrt{-z^2}}{4z}; |z| > 1$$

01.27.27.3214.01

$$\begin{aligned} \tanh^{-1}(\sqrt{z}) = & \frac{\pi z}{4\sqrt{-z^2}} \left(1 + \frac{2(z+1)}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) + \\ & \frac{1}{4} \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} + \sqrt{\frac{1}{1+z}} \sqrt{1+z} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right); |z| \neq 1 \end{aligned}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}(\sqrt{1-z})$

01.27.27.3215.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{sech}^{-1}(\sqrt{1-z})$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.3216.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \wedge (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3217.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3218.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) + \frac{\pi i}{2} \quad ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3219.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi \sqrt{z-1}}{2\sqrt{-z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{1}{z}} \sqrt{z} \operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

01.27.27.3220.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) \quad ; \operatorname{Im}(z) > 0$$

01.27.27.3221.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi i}{2} \quad ; -\pi < \arg(z) \leq 0$$

01.27.27.3222.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) + \frac{\pi i}{2} \quad ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3223.01

$$\tanh^{-1}(\sqrt{z}) = \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \frac{\pi \sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

01.27.27.3224.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3225.01

$$\tanh^{-1}(\sqrt{z}) = \operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) - \frac{\pi i}{2} \quad ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3226.01

$$\tanh^{-1}(\sqrt{z}) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) + \frac{\pi i}{2} \quad ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3227.01

$$\tanh^{-1}(\sqrt{z}) = \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) - \frac{\pi \sqrt{1-z}}{2\sqrt{z-1}}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1}\right)$

01.27.27.3228.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + 1}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - 1}\right)$

01.27.27.3229.01

$$\tanh^{-1}(\sqrt{z}) = \pi i + 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}}\right); \operatorname{Im}(z) > 0$$

01.27.27.3230.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}}\right) - \pi i; -\pi < \arg(z) \leq 0$$

01.27.27.3231.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}}\right) + \pi i; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3232.01

$$\tanh^{-1}(\sqrt{z}) = 2 \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - 1}}\right) - \frac{\pi \sqrt{-z^2}}{z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} + 1)\right)$

01.27.27.3233.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2 \sqrt{1-z}}{\sqrt{1-z} + 1}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2} \sqrt{1-z} / (\sqrt{1-z} - 1)\right)$

01.27.27.3234.01

$$\tanh^{-1}(\sqrt{z}) = \pi i + 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2 \sqrt{1-z}}{\sqrt{1-z} - 1}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3235.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}} \right) - \pi i /; \operatorname{Im}(z) < 0, z > 1$$

01.27.27.3236.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}} \right) + \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3237.01

$$\tanh^{-1}(\sqrt{z}) = 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1} \left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}} \right) - \frac{\pi\sqrt{1-z}}{\sqrt{z-1}}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1} \left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + \sqrt{-z}} \right)$

01.27.27.3238.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}} \right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.27.27.3239.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}} \right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.3240.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}} \right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3241.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{2\sqrt{-z^2}} + 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}} \right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1} \left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - \sqrt{-z}} \right)$

01.27.27.3242.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}} \right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.27.27.3243.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1} \left(\frac{\sqrt{2} (1-z)^{1/4}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}} \right) + \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.27.27.3244.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2}(1-z)^{1/4}}{\sqrt{\sqrt{1-z}-\sqrt{-z}}}\right) + \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}+\sqrt{-z})}\right)$

01.27.27.3245.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0$$

01.27.27.3246.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.3247.01

$$\tanh^{-1}(\sqrt{z}) = -2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3248.01

$$\tanh^{-1}(\sqrt{z}) = \frac{\pi z}{2\sqrt{-z^2}} + 2\sqrt{z}\sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-\sqrt{-z})}\right)$

01.27.27.3249.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi$$

01.27.27.3250.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) + \frac{\pi i}{2}; -\pi < \arg(z) \leq 0$$

01.27.27.3251.01

$$\tanh^{-1}(\sqrt{z}) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) + \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right)$

01.27.27.3252.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right) - \frac{\pi i}{2} \quad ; \operatorname{Im}(z) \geq 0$$

01.27.27.3253.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right) + \frac{\pi i}{2} \quad ; \operatorname{Im}(z) < 0$$

01.27.27.3254.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{1+z}\right) - \frac{1}{2} \sqrt{z} \sqrt{-\frac{1}{z}} \pi$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right)$

01.27.27.3255.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) \quad ; z \notin (-\infty, 1)$$

01.27.27.3256.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) - \pi i \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3257.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right) \quad ; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3258.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1 \right) + \frac{\sqrt{z}}{2} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{z-1}{z+1}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$

01.27.27.3259.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4} \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3260.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) + \frac{\pi i}{4} \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3261.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{3\pi i}{4} \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3262.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right) - \frac{\pi i}{4} \quad ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3263.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \frac{iz}{2\sqrt{-z^2}} - 1\right) \frac{\pi i}{2} + \frac{1}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\frac{1-z}{2\sqrt{-z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right)$

01.27.27.3264.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{3\pi i}{4} \quad ; |z| < 1 \wedge 0 < \arg(z) \leq \pi$$

01.27.27.3265.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{3\pi i}{4} \quad ; |z| < 1 \wedge \operatorname{Im}(z) < 0$$

01.27.27.3266.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} - \frac{3i\sqrt{-z^2}}{2z} - 1\right) \frac{\pi i}{2} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) \quad ; |z| < 1$$

01.27.27.3267.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{\pi i}{4} \quad ; |z| > 1 \wedge \operatorname{Im}(z) > 0$$

01.27.27.3268.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) - \frac{\pi i}{4} \quad ; |z| > 1 \wedge \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 0)$$

01.27.27.3269.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) + \frac{\pi i}{4} \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3270.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi z}{4\sqrt{-z^2}} + \frac{1}{2} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) \quad ; |z| > 1$$

01.27.27.3271.01

$$\begin{aligned} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = & \frac{\pi}{8} \left(2i \left(-1 + \sqrt{\frac{-1+z}{z}} \sqrt{\frac{z}{-1+z}} + \frac{3iz}{2\sqrt{-z^2}} \right) \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) + \frac{z}{\sqrt{-z^2}} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) + \\ & \frac{1}{4} \left(1 - \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} + \sqrt{\frac{1}{1+z}} \sqrt{1+z} \left(1 + \frac{z+1}{z-1} \sqrt{\left(\frac{z-1}{z+1}\right)^2} \right) \right) \operatorname{sech}^{-1}\left(\frac{z-1}{2\sqrt{-z}}\right) \quad ; |z| \neq 1 \end{aligned}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{1-z})$

01.27.27.3272.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}(\sqrt{1-z}) \quad ; \quad 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3273.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}(\sqrt{1-z}) \quad ; \quad \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3274.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{sech}^{-1}(\sqrt{1-z}) - \frac{1}{2} \pi \sqrt{\frac{1}{1-z}} \sqrt{-\frac{1}{z}} \sqrt{(1-z)z}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

01.27.27.3275.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) \quad ; \quad |\arg(z)| < \pi$$

01.27.27.3276.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) \quad ; \quad (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3277.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

01.27.27.3278.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) \quad ; \quad z \notin (-\infty, 1)$$

01.27.27.3279.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) - \pi i \quad ; \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3280.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) \quad ; \quad (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3281.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) + \frac{\pi i}{2} \left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} - 1 \right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

01.27.27.3282.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) /; |\arg(z)| < \pi$$

01.27.27.3283.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3284.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} + 1}\right)$

01.27.27.3285.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + 1}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3286.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + 1}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3287.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + 1}}\right) - \frac{\pi \sqrt{z-1}}{2 \sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2} (1-z)^{1/4} / \sqrt{\sqrt{1-z} - 1}\right)$

01.27.27.3288.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - 1}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.27.27.3289.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - 1}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3290.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3291.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3292.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z}-1}}\right) - \frac{1}{2}\pi \left(\frac{\sqrt{z-1}}{\sqrt{1-z}} + \frac{2\sqrt{-z^2}}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}+1)}\right)$

01.27.27.3293.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3294.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3295.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+1}}\right) - \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2\sqrt{1-z}/(\sqrt{1-z}-1)}\right)$

01.27.27.3296.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3297.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3298.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3299.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-1}}\right) - \frac{\pi\sqrt{1-z}}{2\sqrt{z-1}}$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2}(1-z)^{1/4} / \sqrt{\sqrt{1-z} + \sqrt{-z}}\right)$

01.27.27.3300.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right); z \notin (-\infty, 1)$$

01.27.27.3301.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3302.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3303.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} + \sqrt{-z}}}\right) - \frac{\pi i}{2} \left(1 - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{2}(1-z)^{1/4} / \left(\sqrt{\sqrt{1-z} - \sqrt{-z}}\right)\right)$

01.27.27.3304.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.3305.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i + 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3306.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3307.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - \frac{2i\sqrt{-z^2}}{z} - 1\right) + 2 \operatorname{sech}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z}}{\sqrt{\sqrt{1-z} - \sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right)$

01.27.27.3308.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right); z \notin (-\infty, 1)$$

01.27.27.3309.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right) - \pi i; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3310.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3311.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} \left(1 - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + 2\sqrt{z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}+\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right)$

01.27.27.3312.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right) - \pi i; 0 < \arg(z) \leq \pi$$

01.27.27.3313.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \pi i + 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3314.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3315.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - \frac{2i\sqrt{-z^2}}{z} - 1\right) + 2 \operatorname{sech}^{-1}\left(\sqrt{\frac{2\sqrt{1-z}}{\sqrt{1-z}-\sqrt{-z}}}\right)$$

Involving $\tanh^{-1}(\sqrt{1-z})$

Involving $\tanh^{-1}(\sqrt{1-z})$ and $\operatorname{sech}^{-1}(\sqrt{z})$

$$\text{01.27.27.0041.01} \\ \tanh^{-1}(\sqrt{1-z}) = \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{z})$

$$\text{01.27.27.3316.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}(\sqrt{z}) \text{ ; } 0 < \arg(z) \leq \pi$$

$$\text{01.27.27.3317.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}(\sqrt{z}) - \frac{\pi i}{2} \text{ ; } -\pi < \arg(z) \leq 0$$

$$\text{01.27.27.3318.01} \\ \tanh^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -\frac{\pi \sqrt{-z}}{2\sqrt{z}} + \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{z})$

$$\text{01.27.27.3319.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}(\sqrt{z}) \text{ ; } 0 < \arg(z) \leq \pi$$

$$\text{01.27.27.3320.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \operatorname{sech}^{-1}(\sqrt{z}) - \frac{\pi i}{2} \text{ ; } \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.27.27.3321.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\operatorname{sech}^{-1}(\sqrt{z}) + \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.27.27.3322.01} \\ \tanh^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi \sqrt{(1-z)z}}{2\sqrt{-z}} \sqrt{\frac{1}{1-z}} + \sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3323.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; |\arg(z)| < \pi$$

01.27.27.3324.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3325.01

$$\operatorname{ArcTanh}\left[\frac{\sqrt{z-1}}{\sqrt{z}}\right] = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z} - 1}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3326.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3327.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 1)$$

01.27.27.3328.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3329.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3330.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \left(\sqrt{z} \sqrt{\frac{1}{z}} - 1\right) \frac{\pi i}{2} + \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3331.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (0, 1)$$

01.27.27.3332.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3333.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3334.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.27.27.3335.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i; (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3336.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - 1\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3337.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3338.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.3339.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3340.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{1}{2}\pi\sqrt{z}\sqrt{-\frac{1}{z}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3341.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; 0 \leq \arg(z) < \pi$$

01.27.27.3342.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3343.01

$$\tanh^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3344.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3345.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3346.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3347.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi \sqrt{1-z} \sqrt{-z}}{2\sqrt{z}} \sqrt{\frac{1}{1-z}} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3348.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3349.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3350.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3351.01

$$\tanh^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi \sqrt{1-z} \sqrt{-z}}{2} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{1-z}} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.27.27.3352.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3353.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3354.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3355.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi \sqrt{1-z} \sqrt{-z}}{2 \sqrt{z}} \sqrt{\frac{1}{1-z}} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.27.27.3356.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3357.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3358.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3359.01

$$\tanh^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi \sqrt{1-z} \sqrt{-z}}{2} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{1-z}} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z+a}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3360.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) \geq 0$$

01.27.27.3361.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3362.01

$$\tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z-1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{1}{2} \sqrt{z} \sqrt{-\frac{1}{z}} \pi$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3363.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); z \notin (-\infty, -1)$$

01.27.27.3364.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3365.01

$$\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{a-z}}{\sqrt{-a-z}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3366.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3367.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3368.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3369.01

$$\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{-z} z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}}$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3370.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); z \notin (-\infty, 1)$$

01.27.27.3371.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3372.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3373.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \left(1 - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-a}{z+a}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3374.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3375.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; \operatorname{Im}(z) < 0$$

01.27.27.3376.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.27.27.3377.01

$$\tanh^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) = \frac{1}{2} \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{-z} z \sqrt{z^2-1}}{2 \sqrt{z^2-z^4}} \sqrt{-\frac{1}{z}}$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3378.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); z \notin (-\infty, -1)$$

01.27.27.3379.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3380.01

$$\tanh^{-1}\left(\sqrt{\frac{z-1}{z+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - 1}\right)$$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\tanh^{-1}\left(\sqrt{1-z^2}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.0042.02

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3381.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \operatorname{sech}^{-1}(z) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3382.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \operatorname{sech}^{-1}(z) - \pi i /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3383.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = -\operatorname{sech}^{-1}(z) + \pi i /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3384.01

$$\tanh^{-1}\left(\sqrt{1-z^2}\right) = \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} + \frac{z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\right) \frac{\pi}{2} + \sqrt{z+1} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

Involving $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.3385.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}(z) /; \operatorname{Im}(z) > 0$$

01.27.27.3386.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \text{ ; } -\pi < \arg(z) \leq 0$$

01.27.27.3387.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \frac{3\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3388.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3389.01

$$\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}(z) - \frac{\pi}{2} \left(\frac{\sqrt{z-1}}{\sqrt{1-z}} - \frac{\sqrt{z^2} \sqrt{-1+z^2}}{z \sqrt{1-z^2}} + \frac{\sqrt{-z-1}}{\sqrt{z+1}} \right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.3390.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}(z) \text{ ; } \operatorname{Im}(z) > 0$$

01.27.27.3391.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \text{ ; } \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3392.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \frac{3\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3393.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} \text{ ; } (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3394.01

$$\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \sqrt{1-z} \sqrt{\frac{1}{1-z}} \operatorname{sech}^{-1}(z) - \frac{\pi}{2} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} - \frac{\sqrt{z^2} \sqrt{z^2-1}}{z} \sqrt{\frac{1}{1-z^2}} + \frac{\sqrt{z-1}}{\sqrt{1-z}} \right)$$

Involving $\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.3395.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \operatorname{sech}^{-1}(z) \ ; \ \operatorname{Re}(z) > 0$$

01.27.27.3396.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\operatorname{sech}^{-1}(z) - \pi i \ ; \ \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3397.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi i \ ; \ -\pi < \arg(z) < -\frac{\pi}{2} \ \vee \ (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3398.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi i \ ; \ (i z \in \mathbb{R} \wedge i z > 0) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3399.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = -\operatorname{sech}^{-1}(z) \ ; \ (i z \in \mathbb{R} \wedge i z < 0)$$

01.27.27.3400.01

$$\tanh^{-1}\left(z\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi}{2} \left(\frac{z}{\sqrt{z^2-1}} \sqrt{\frac{1-z^2}{z^2}} + \frac{\sqrt{z^2}\sqrt{z^2-1}}{\sqrt{1-z^2}} \sqrt{\frac{1}{z^2}} \right) + z\sqrt{z+1} \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3401.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \ ; \ 0 \leq \arg(z) \leq \frac{\pi}{2} \ \vee \ (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3402.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3403.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3404.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3405.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3406.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{i \sqrt{1-z^2}}{\sqrt{z^2-1}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \right) + \frac{\sqrt{-1-z} \sqrt{z^2}}{\sqrt{-z^2} \sqrt{1+z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3407.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2}; 0 \leq \arg(z) < \pi$$

01.27.27.3408.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0$$

01.27.27.3409.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3410.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3411.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \left(\sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} - \frac{i\sqrt{z^2-z^4}}{z\sqrt{-1+z^2}} - 1\right) \frac{\pi i}{2} + \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3412.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3413.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0$$

01.27.27.3414.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3415.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3416.01

$$\tanh^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \left(\sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} - \frac{i\sqrt{-z^2}}{z} - 1\right) \frac{\pi i}{2} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3417.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3418.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0$$

01.27.27.3419.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3420.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3421.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \left(\sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} - \frac{i\sqrt{-z^2}}{z} - 1\right) \frac{\pi i}{2} + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3422.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0$$

01.27.27.3423.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3424.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3425.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i; (i z \in \mathbb{R} \wedge i z < 0) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3426.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.3427.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi\sqrt{z^2-1}}{2\sqrt{1-z^2}}\left(z\sqrt{\frac{1}{z^2}}-1\right) + \frac{\sqrt{-z-1}\sqrt{z^2}}{\sqrt{-z^2}\sqrt{z+1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3428.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.3429.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3430.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3431.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi i - \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3432.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi\sqrt{z^2-1}}{2\sqrt{1-z^2}}\left(\sqrt{z^2}\sqrt{\frac{1}{z^2}} - \frac{\sqrt{z^2}}{z}\right) + \sqrt{\frac{z}{z+1}}\sqrt{\frac{z+1}{z}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3433.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.27.27.3434.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.27.27.3435.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3436.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.27.27.3437.01

$$\tanh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{-z}}{\sqrt{z}} - \sqrt{-z^2} \sqrt{\frac{1}{z^2}} \right) + \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

Involving $\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3438.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.3439.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3440.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3441.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi i - \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3442.01

$$\tanh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi\sqrt{z^2-1}}{2\sqrt{1-z^2}}\left(\sqrt{z^2}\sqrt{\frac{1}{z^2}} - \frac{\sqrt{z^2}}{z}\right) + \sqrt{\frac{z}{z+1}}\sqrt{\frac{z+1}{z}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+a}}{z}\right)$

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2+1}}{z}\right)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3443.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3444.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{3\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3445.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3446.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{3\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3447.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1+1}}{z}\right) = \frac{\pi}{2}\left(\frac{i}{2} - \sqrt{-\frac{1}{z^2}}z\right) + \frac{i\sqrt{-iz-1}}{2\sqrt{iz+1}}\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{\sqrt{1+z^2-1}}{z}\right)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3448.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1-1}}{z}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.27.27.3449.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1-1}}{z}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.27.27.3450.01

$$\tanh^{-1}\left(\frac{\sqrt{z^2+1}-1}{z}\right) = \frac{i\sqrt{-iz-1}}{2\sqrt{iz+1}} \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+a}}\right)$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3451.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right) = \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3452.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right) = -\frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.3453.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2+1}}\right) = \frac{i\sqrt{-iz-1}}{2\sqrt{iz+1}} \operatorname{sech}^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4}$$

Involving $\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{i}{z}\right)$

01.27.27.3454.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right) = -\frac{\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.27.27.3455.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right) = \frac{3\pi i}{4} + \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3456.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right) = -\frac{\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.27.27.3457.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2-1}}\right) = \frac{3\pi i}{4} - \frac{1}{2} \operatorname{sech}^{-1}\left(\frac{i}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.27.27.3458.01

$$\tanh^{-1}\left(\frac{z}{\sqrt{1+z^2}-1}\right) = \frac{\pi}{2}\left(\frac{i}{2} - \sqrt{-\frac{1}{z^2}} z\right) + \frac{i\sqrt{-iz-1}}{2\sqrt{iz+1}} \operatorname{sech}^{-1}\left(\frac{i}{z}\right)$$

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$

Involving $\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{-2+z^2}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.3459.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2 \operatorname{sech}^{-1}(z) - \pi i ; |z| > \sqrt{2} \wedge \operatorname{Im}(z) > 0$$

01.27.27.3460.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = -2 \operatorname{sech}^{-1}(z) + \pi i ; |z| > \sqrt{2} \wedge \operatorname{Im}(z) < 0$$

01.27.27.3461.01

$$\tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\theta\left(\left|\sqrt{z^2-1}\right|, -1\right) + \frac{\sqrt{z^2}}{z} - 1 \right) \pi - \frac{2\sqrt{z-1}\sqrt{z^2}}{\sqrt{\frac{1}{z}-1}z^{3/2}} \operatorname{sech}^{-1}(z)$$

01.27.27.3462.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) = & -\frac{\pi}{2\sqrt{1-z^2}} \left((z^2-2) \sqrt{\frac{z^4}{z^2-1}} \sqrt{\frac{z^2-1}{z^4}} \sqrt{\frac{z^2-1}{(z^2-2)^2}} - \right. \\ & \left. \sqrt{1-\frac{1}{z^2}} z \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \sqrt{-\frac{i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) \right) - \\ & \frac{2z}{\sqrt{1-z^2}} \sqrt{1-\frac{1}{z^2}} \left(\frac{\pi}{2} - \frac{\sqrt{-1+z}\sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}(z) \right) \end{aligned}$$

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$

Involving $\tanh^{-1}\left(\frac{-2+z^2}{2\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.27.27.3463.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = -\frac{\pi i}{2} - 2 \operatorname{sech}^{-1}(z) ; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3464.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = \frac{\pi i}{2} - 2 \operatorname{sech}^{-1}(z) ; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.27.27.3465.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = -\frac{3\pi i}{2} - 2 \operatorname{sech}^{-1}(z) ; \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3466.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = \frac{3\pi i}{2} - 2 \operatorname{sech}^{-1}(z) ; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3467.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = \frac{5\pi i}{2} - 2 \operatorname{sech}^{-1}(z) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3468.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = -\frac{3\pi i}{2} + 2 \operatorname{sech}^{-1}(z) ; (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3469.01

$$\tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) = i\pi \left(1 - \frac{i\sqrt{z^2}}{2\sqrt{-z^2}} - \sqrt{\frac{z^2}{z^2 - 1}} \sqrt{\frac{z^2 - 1}{z^2}} + \frac{iz}{\sqrt{1 - z^2}} \sqrt{1 - \frac{1}{z^2}} \right) - 2\sqrt{z + 1} \sqrt{\frac{1}{z + 1}} \operatorname{sech}^{-1}(z)$$

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$

Involving $\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3470.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i - 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{4} \leq \arg(z) \leq \frac{\pi}{2}$$

01.27.27.3471.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\pi i + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right) ; \frac{\pi}{2} < \arg(z) \leq \frac{3\pi}{4}$$

01.27.27.3472.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = \pi i + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{2}$$

01.27.27.3473.01

$$\tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = -\pi i - 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq -\frac{\pi}{4}$$

01.27.27.3474.01

$$\begin{aligned} \tanh^{-1}\left(\frac{2z\sqrt{z^2-1}}{1-2z^2}\right) = & -\frac{\sqrt{z^2-1}}{\sqrt{1-z^2}} \left(\frac{2\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \right. \\ & \left. \frac{\pi}{2} \left(\frac{\sqrt{z^2-1}z}{\sqrt{z^4-z^2}} + \sqrt{\frac{1}{z}} \sqrt{\frac{1}{\sqrt{2}z-1}} \sqrt{\sqrt{2}z-1} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\sqrt{2}z-1} \sqrt{-\frac{1}{\sqrt{2}z+1}} + \frac{\sqrt{z^2}}{z} - 2 \right) \right) \end{aligned}$$

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$

Involving $\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.27.27.3475.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \frac{\pi}{2}$$

01.27.27.3476.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.27.27.3477.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{3\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.27.27.3478.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.27.27.3479.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z > 0)$$

01.27.27.3480.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{3\pi i}{2} - 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz < 0) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.27.27.3481.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = -\frac{5\pi i}{2} + 2 \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.27.27.3482.01

$$\tanh^{-1}\left(\frac{1-2z^2}{2z\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} \left(-\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{-iz} \sqrt{\frac{i}{z}} + \sqrt{-\frac{i}{z}} \sqrt{iz} + \frac{\sqrt{z^2}}{z} - 2 \right) + \frac{2\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) \right)$$

Zeros

01.27.30.0001.01

$$\tanh^{-1}(z) = 0; z = 0$$

History

–J. Houel (1878)

The function \tanh^{-1} is encountered often in mathematics and the natural sciences.

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