ArcCsch

Notations

Traditional name

Inverse hyperbolic cosecant

Traditional notation

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

Mathematica StandardForm notation

`ArcCsch[z]`

Primary definition

01.29.02.0001.01

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

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

Specific values

Values at fixed points

01.29.03.0001.01

$$\operatorname{csch}^{-1}(0) = \tilde{\infty}$$

01.29.03.0002.01

$$\operatorname{csch}^{-1}(i) = -\frac{\pi i}{2}$$

01.29.03.0003.01

$$\operatorname{csch}^{-1}(-i) = \frac{\pi i}{2}$$

01.29.03.0004.01

$$\operatorname{csch}^{-1}\left(i\left(\sqrt{6}-\sqrt{2}\right)\right) = -\frac{5\pi i}{12}$$

01.29.03.0005.01

$$\operatorname{csch}^{-1}\left(i\left(\sqrt{2}-\sqrt{6}\right)\right)==\frac{5\pi i}{12}$$

01.29.03.0006.01

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

01.29.03.0007.01

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

01.29.03.0008.01

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

01.29.03.0009.01

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

01.29.03.0010.01

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

01.29.03.0011.01

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

01.29.03.0012.01

$$\operatorname{csch}^{-1}\left(i\left(\sqrt{5}-1\right)\right)==-\frac{3\pi i}{10}$$

01.29.03.0013.01

$$\operatorname{csch}^{-1}\left(i\left(1-\sqrt{5}\right)\right)==\frac{3\pi i}{10}$$

01.29.03.0014.01

$$\operatorname{csch}^{-1}\left(i\sqrt{2}\right)==-\frac{\pi i}{4}$$

01.29.03.0015.01

$$\operatorname{csch}^{-1}\left(-i\sqrt{2}\right)==\frac{\pi i}{4}$$

01.29.03.0016.01

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

01.29.03.0017.01

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

01.29.03.0018.01

$$\operatorname{csch}^{-1}(2\, i) == -\frac{\pi\, i}{6}$$

01.29.03.0019.01

$$\operatorname{csch}^{-1}(-2\, i) == \frac{\pi\, i}{6}$$

01.29.03.0020.01

$$\operatorname{csch}^{-1}\left(i\sqrt{2\left(2+\sqrt{2}\right)}\right) == -\frac{\pi\, i}{8}$$

01.29.03.0021.01

$$\operatorname{csch}^{-1}\left(-i\sqrt{2\left(2+\sqrt{2}\right)}\right) == \frac{\pi\, i}{8}$$

01.29.03.0022.01

$$\operatorname{csch}^{-1}\left(i\left(1+\sqrt{5}\right)\right) == -\frac{\pi\, i}{10}$$

01.29.03.0023.01

$$\operatorname{csch}^{-1}\left(-i\left(1+\sqrt{5}\right)\right) == \frac{\pi\, i}{10}$$

01.29.03.0024.01

$$\operatorname{csch}^{-1}\left(i\left(\sqrt{2}+\sqrt{6}\right)\right) == -\frac{\pi\, i}{12}$$

01.29.03.0025.01

$$\operatorname{csch}^{-1}\left(-i\left(\sqrt{2}+\sqrt{6}\right)\right) == \frac{\pi\, i}{12}$$

01.29.03.0026.01

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

01.29.03.0027.01

$$\operatorname{csch}^{-1}(-1) == \log\left(\sqrt{2}-1\right)$$

Values at infinities

01.29.03.0028.01

$$\operatorname{csch}^{-1}(\infty) == 0$$

01.29.03.0029.01

$$\operatorname{csch}^{-1}(-\infty) == 0$$

01.29.03.0030.01

$$\operatorname{csch}^{-1}(i\, \infty) == 0$$

01.29.03.0031.01

$$\operatorname{csch}^{-1}(-i\, \infty) == 0$$

01.29.03.0032.01

$\operatorname{csch}^{-1}(\tilde{\infty}) == 0$

General characteristics

Domain and analyticity

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

01.29.04.0001.01

$z \longrightarrow \operatorname{csch}^{-1}(z) :: \mathbb{C} \longrightarrow \mathbb{C}$

Symmetries and periodicities

Parity

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

01.29.04.0002.01

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

Mirror symmetry

01.29.04.0003.01

$\operatorname{csch}^{-1}(\bar{z}) == \overline{\operatorname{csch}^{-1}(z)} \;/;\; i\, z \notin (-1,\, 1)$

Periodicity

No periodicity

Poles and essential singularities

The function $\operatorname{csch}^{-1}(z)$ has one singular point:
$z == \tilde{\infty}$ is the simple pole with residue -1.

01.29.04.0004.01

$\mathcal{S}ing_z\left(\operatorname{csch}^{-1}(z)\right) == \{\{\tilde{\infty},\, 1\}\}$

01.29.04.0005.01

$\operatorname{res}_z\left(\operatorname{csch}^{-1}(z)\right)(\tilde{\infty}) == -1$

Branch points

The function $\operatorname{csch}^{-1}(z)$ has three branch points: $z = \pm i,\; z = 0$.

01.29.04.0006.01

$\mathcal{BP}_z\left(\operatorname{csch}^{-1}(z)\right) == \{-i,\, 0,\, i\}$

01.29.04.0007.01

$\mathcal{R}_z\left(\operatorname{csch}^{-1}(z),\, i\right) == 2$

01.29.04.0008.01

$\mathcal{R}_z\left(\operatorname{csch}^{-1}(z),\, -i\right) == 2$

01.29.04.0009.01

$$\mathcal{R}_z\left(\operatorname{csch}^{-1}(z),\, 0\right) = \log$$

Branch cuts

The function $\operatorname{csch}^{-1}(z)$ is a single-valued function on the z-plane cut along the intervals $(-i,\ 0)$ and $(0,\ i)$.

The function $\operatorname{csch}^{-1}(z)$ is continuous from the right on the interval $(-i,\ 0)$ and from the left on the interval $(0,\ i)$.

01.29.04.0010.01

$$\mathcal{BC}_z\left(\operatorname{csch}^{-1}(z)\right) = \{\{[-i,\ 0),\ -1\},\ \{(0,\ i],\ 1\}\}$$

01.29.04.0011.01

$$\lim_{\epsilon\to+0} \operatorname{csch}^{-1}(x+\epsilon) = \operatorname{csch}^{-1}(x) \;/;\; 0 < i\,x < 1$$

01.29.04.0012.01

$$\lim_{\epsilon\to+0} \operatorname{csch}^{-1}(x-\epsilon) = i\,\pi - \operatorname{csch}^{-1}(x) \;/;\; 0 < i\,x < 1$$

01.29.04.0013.01

$$\lim_{\epsilon\to+0} \operatorname{csch}^{-1}(x-\epsilon) = \operatorname{csch}^{-1}(x) \;/;\; -1 < i\,x < 0$$

01.29.04.0014.01

$$\lim_{\epsilon\to+0} \operatorname{csch}^{-1}(x+\epsilon) = -i\,\pi - \operatorname{csch}^{-1}(x) \;/;\; -1 < i\,x < 0$$

Analytic continuations

The analytic continuation of csch^{-1} has infinitely many sheets; the values of $\widetilde{\operatorname{csch}}^{-1}$ are $\widetilde{\operatorname{csch}}^{-1}(z) = \operatorname{csch}^{-1}(z) + 2\,k\,i\,\pi \;/;\; k \in \mathbb{Z}$.

Series representations

Generalized power series

Expansions at generic point $z = z_0$

For the function itself

01.29.06.0023.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - \left(\frac{z_0}{z_0+i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0+i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(2\pi i \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{z_0-i}{z_0}\right)+\pi}{2\pi}\right\rfloor + \right.$$

$$\left. \left(\frac{z_0}{z_0-i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0-i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(z_0) + \frac{z-z_0}{z_0^2\sqrt{\frac{z_0^2+1}{z_0^2}}} - \frac{\left(2z_0^2+1\right)(z-z_0)^2}{2\sqrt{1+\frac{1}{z_0^2}}\, z_0^3\left(z_0^2+1\right)} + \ldots\right)\right) /; (z \to z_0)$$

01.29.06.0024.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - \left(\frac{z_0}{z_0+i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0+i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(2\pi i \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{z_0-i}{z_0}\right)+\pi}{2\pi}\right\rfloor + \right.$$

$$\left. \left(\frac{z_0}{z_0-i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0-i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(z_0) + \frac{z-z_0}{z_0^2\sqrt{\frac{z_0^2+1}{z_0^2}}} - \frac{\left(2z_0^2+1\right)(z-z_0)^2}{2\sqrt{1+\frac{1}{z_0^2}}\, z_0^3\left(z_0^2+1\right)} + O\left((z-z_0)^3\right)\right)\right)$$

01.29.06.0025.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \left(\frac{z_0}{z_0+i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0+i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(2\pi i \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{z_0-i}{z_0}\right)+\pi}{2\pi}\right\rfloor + \right.$$

$$\left. \left(\frac{z_0}{z_0-i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0-i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{\pi i}{2} + \sum_{k=0}^{\infty} (-1)^{k-1} z_0^{-k-1}\, {}_3F_2\left(\frac{1}{2}, \frac{k+1}{2}, \frac{k}{2}+1; 1, \frac{3}{2}; -\frac{1}{z_0^2}\right)(z-z_0)^k\right)\right)$$

01.29.06.0026.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - \left(\frac{z_0}{z_0+i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0+i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(-\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(2\pi i^{\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor \left\lfloor \frac{\arg\left(\frac{z_0-i}{z_0}\right)+\pi}{2\pi}\right\rfloor + \left(\frac{z_0}{z_0-i}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{z_0-i}{z_0}\right)^{\frac{1}{2}\left\lfloor \frac{\arg\left(\frac{i(z-z_0)}{z z_0}\right)}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(z_0)\right)\right)(1+O(z-z_0))$$

Expansions on branch cuts

For the function itself

In the lower half-plane

01.29.06.0027.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x) + \frac{z-x}{x\sqrt{x^2+1}} - \frac{(2x^2+1)(z-x)^2}{2\sqrt{x^2+1}\; x^2 (x^2+1)} + \ldots\right) /; (z \to x) \land i x \in \mathbb{R} \land 0 < i x < 1$$

01.29.06.0028.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x) + \frac{z-x}{x\sqrt{x^2+1}} - \frac{(2x^2+1)(z-x)^2}{2\sqrt{x^2+1}\; x^2 (x^2+1)} + O\left((z-x)^3\right)\right) /; i x \in \mathbb{R} \land 0 < i x < 1$$

01.29.06.0029.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi}\right\rfloor} \left(\frac{\pi i}{2} + \sum_{k=0}^{\infty} (-1)^{k-1} x^{-k-1} {}_3F_2\left(\frac{1}{2}, \frac{k+1}{2}, \frac{k}{2}+1; 1, \frac{3}{2}; -\frac{1}{x^2}\right)(z-x)^k\right) /; i x \in \mathbb{R} \land 0 < i x < 1$$

01.29.06.0030.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - e^{\pi i \left\lfloor \frac{\arg(i(z-x))}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x)\right)(1+O(z-x)) /; i x \in \mathbb{R} \land 0 < i x < 1$$

In the upper half-plane

01.29.06.0031.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - 2\pi i^{\left\lfloor \frac{\arg(-i(z-x))}{2\pi}\right\rfloor} \left\lfloor \frac{\arg(-i(z-x))}{2\pi}\right\rfloor - e^{\pi i \left\lfloor \frac{\arg(-i(z-x))}{2\pi}\right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x) - \frac{z-x}{x\sqrt{x^2+1}} + \frac{(2x^2+1)(z-x)^2}{2\sqrt{x^2+1}\; x^2 (x^2+1)} + \ldots\right) /;$$

$$(z \to x) \land i x \in \mathbb{R} \land -1 < i x < 0$$

01.29.06.0032.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - 2\pi i^{\left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor - e^{\pi i \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x) - \frac{z-x}{x\sqrt{x^2+1}} + \frac{(2x^2+1)(z-x)^2}{2\sqrt{x^2+1}\; x^2 (x^2+1)} + O\left((z-x)^3\right) \right) /;\; i\,x \in \mathbb{R} \land -1 < i\,x < 0$$

01.29.06.0033.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\pi i^{\left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor - e^{\pi i \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left(\frac{\pi i}{2} + \sum_{k=0}^{\infty} (-1)^{k-1} x^{-k-1} {}_3F_2\left(\frac{1}{2}, \frac{k+1}{2}, \frac{k}{2}+1; 1, \frac{3}{2}; -\frac{1}{x^2}\right) (z-x)^k \right) /;\; i\,x \in \mathbb{R} \land -1 < i\,x < 0$$

01.29.06.0034.01

$$\operatorname{csch}^{-1}(z) \propto \frac{\pi i}{2} - 2\pi i^{\left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor - e^{\pi i \left\lfloor \frac{\arg(-i(z-x))}{2\pi} \right\rfloor} \left(\frac{i\pi}{2} - \operatorname{csch}^{-1}(x) \right) (1 + O(z-x)) /;\; i\,x \in \mathbb{R} \land -1 < i\,x < 0$$

Expansions at $z = 0$

For the function itself

01.29.06.0001.02

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{2} \sqrt{\frac{1}{z^2}}\; z \left(\log\left(\frac{4}{z^2}\right) + \frac{z^2}{2} + \frac{3z^4}{16} + \ldots \right) /;\; (z \to 0)$$

01.29.06.0035.01

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{2} \sqrt{\frac{1}{z^2}}\; z \left(\log\left(\frac{4}{z^2}\right) + \frac{z^2}{2} + \frac{3z^4}{16} + O\left(z^6\right) \right)$$

01.29.06.0002.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}}\; z \left(\log\left(\frac{4}{z^2}\right) - \sum_{k=1}^{\infty} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{2k}}{k\, k!} \right) /;\; |z| < 1$$

01.29.06.0003.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}}\; z \left(\log\left(\frac{4}{z^2}\right) + \frac{z^2}{2}\, {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -z^2\right) \right) /;\; i\,z \notin (-\infty, -1) \bigwedge i\,z \notin (1, \infty)$$

01.29.06.0004.02

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{2} \sqrt{\frac{1}{z^2}}\; z \log\left(\frac{4}{z^2}\right) + \frac{z^3}{4} \sqrt{\frac{1}{z^2}} \left(1 + O\left(z^2\right)\right)$$

01.29.06.0036.01

$$\operatorname{csch}^{-1}(z) \propto \begin{cases} \log(z) & \arg(z) < -\frac{\pi}{2} \bigvee \arg(z) \geq \frac{\pi}{2} \\ -\log(z) & \text{True} \end{cases} /;\; (z \to 0)$$

01.29.06.0037.01

$$\operatorname{csch}^{-1}(z) \propto F_\infty(z) \,/;\, \left(\left(F_n(z) = \frac{1}{2} z \sqrt{\frac{1}{z^2}} \log\left(\frac{4}{z^2}\right) + \frac{1}{4} z^3 \sqrt{\frac{1}{z^2}} \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2 \, k!} = \operatorname{csch}^{-1}(z) + \frac{1}{4(n+2)(n+2)! \sqrt{\frac{1}{z^2}}} \left((-1)^n z^{2n+5} \left(\frac{3}{2}\right)_{n+1}\right) {}_4F_3\left(1, n+\frac{5}{2}, n+2, n+2; n+2, n+3, n+3; -z^2\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.29.06.0038.01

$$\operatorname{csch}^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{1}{z^2}\right) + \log\left(\frac{1}{z^2}\right)\left(\log(2) + \frac{z^2}{4} - \frac{3z^4}{32} + \ldots\right) + \left(\log^2(2) + \frac{1}{2}\log(2) z^2 - \frac{1}{16}(3\log(2) - 1) z^4 + \ldots\right) /; (z \to 0)$$

01.29.06.0039.01

$$\operatorname{csch}^{-1}(z)^2 \propto \frac{1}{4} \log^2\left(\frac{1}{z^2}\right) + \log\left(\frac{1}{z^2}\right)\left(\log(2) + \frac{z^2}{4} - \frac{3z^4}{32} + O\left(z^6\right)\right) + \left(\log^2(2) + \frac{1}{2}\log(2) z^2 - \frac{1}{16}(3\log(2) - 1) z^4 + O\left(z^6\right)\right)$$

01.29.06.0040.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{4}{z^2}\right) + \frac{z^2}{4} \log\left(\frac{1}{z^2}\right) \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2 \, k!} + \frac{z^2}{2} \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^3 \, k!} - \frac{z^2}{4} \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{3}{2}\right)_k \left(\psi\left(-k-\frac{1}{2}\right) - \psi(k+1)\right) z^{2k}}{(k+1)^2 \, k!} /; |z| < 1$$

01.29.06.0041.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{4}{z^2}\right) + \frac{z^2}{4} \log\left(\frac{1}{z^2}\right) \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2 \, k!} + \frac{z^4}{16} \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2 \, k!}\right)^2 /; |z| < 1$$

01.29.06.0042.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{1}{z^2}\right) + \log\left(\frac{1}{4z^2}\right) \log\left(\sqrt{1+z^2} + 1\right) + 2\log^2(2) + \log^2\left(\sqrt{1+z^2} + 1\right) - 2\operatorname{Li}_2\left(\frac{1}{2} - \frac{1}{2}\sqrt{1+z^2}\right) - \frac{z^2}{4} \sum_{k=0}^{\infty} (-1)^k \left(\frac{3}{2}\right)_k \frac{\left(\psi\left(-k-\frac{1}{2}\right) - \psi(k+1)\right) z^{2k}}{(k+1)^2 \, k!} /; |z| < 1$$

01.29.06.0043.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{4} \log^2\left(\frac{4}{z^2}\right) + \frac{z^2}{4} \log\left(\frac{1}{z^2}\right) {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -z^2\right) + \frac{1}{2z^2} {}_4F_3\left(\frac{3}{2}, 1, 1, 1; 2, 2, 2; -z^2\right) - \frac{z^2}{4} \sum_{k=0}^{\infty} (-1)^k \left(\frac{3}{2}\right)_k \frac{\left(\psi\left(-k-\frac{1}{2}\right) - \psi(k+1)\right) z^{2k}}{(k+1)^2 \, k!} /; |z| < 1$$

01.29.06.0044.01

$$\operatorname{csch}^{-1}(z)^2 \equiv \frac{1}{4}\log^2\left(\frac{4}{z^2}\right)^2 + \frac{z^2}{4}\log\left(\frac{4}{z^2}\right){}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -z^2\right) + \frac{z^4}{16}\,{}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; -z^2\right)^2 \;/;\; i\,z \notin (-\infty, -1) \bigwedge i\,z \notin (1, \infty)$$

01.29.06.0045.01

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

01.29.06.0046.01

$$\operatorname{csch}^{-1}(z)^2 \propto \log^2(z) \;/;\; (z \to 0)$$

01.29.06.0047.01

$$\operatorname{csch}^{-1}(z)^2 \equiv F_\infty(z) \;/;$$
$$\left(\left(F_n(z) \equiv \frac{1}{4}\log^2\left(\frac{4}{z^2}\right) + \frac{z^2}{4}\log^2\left(\frac{4}{z^2}\right)\sum_{k=0}^{n}\frac{(-1)^k\left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2\,k!} + \frac{z^4}{16}\left(\sum_{k=0}^{n}\frac{(-1)^k\left(\frac{3}{2}\right)_k z^{2k}}{(k+1)^2\,k!}\right)^2 \equiv -\frac{z^{4(n+2)}}{16\,(n+2)^4\,(n+1)!^2}\right.\right.$$
$$\left.\left.\left(4\,(-1)^n\,i\,(n+2)^2\operatorname{csch}^{-1}(z)\,(n+1)!\,z^{-2(n+2)} + 3\left(\frac{5}{2}\right)_n {}_3F_2\left(1, n+2, n+\frac{5}{2}; n+3, n+3; -z^2\right)\right)^2\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z \equiv i$

For the function itself

01.29.06.0005.02

$$\operatorname{csch}^{-1}(z) \propto -\frac{i\,\pi}{2} + i\sqrt{2}\,\sqrt{-i\,(z-i)}\left(1 + \frac{5\,i\,(z-i)}{12} - \frac{43\,(z-i)^2}{160} + \ldots\right) /;\; (z \to i)$$

01.29.06.0048.01

$$\operatorname{csch}^{-1}(z) \propto -\frac{i\,\pi}{2} + i\sqrt{2}\,\sqrt{-i\,(z-i)}\left(1 + \frac{5\,i\,(z-i)}{12} - \frac{43\,(z-i)^2}{160} + O\left((z-i)^3\right)\right)$$

01.29.06.0006.01

$$\operatorname{csch}^{-1}(z) \equiv -\frac{i\,\pi}{2} + 2\,i\sqrt{-i\,(z-i)}\,\sum_{k=0}^{\infty}\frac{i^k\left(\frac{1}{2}\right)_k}{k!}\,{}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right)(z-i)^k \;/;\; |z-i| < 1$$

01.29.06.0007.01

$$\operatorname{csch}^{-1}(z) \equiv -\frac{i\,\pi}{2} + i\sqrt{2}\,\sqrt{-i\,(z-i)}\;F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2};\ \frac{1}{2};\ \frac{1}{2};\\ ;\ \frac{3}{2};\ \frac{3}{2};\end{matrix}\ -1,\ 1+i\,z\right)$$

01.29.06.0008.02

$$\operatorname{csch}^{-1}(z) \propto -\frac{i\,\pi}{2} + \sqrt{2}\;i\sqrt{-i\,(z-i)}\;(1 + O(z-i))$$

01.29.06.0049.01

$$\operatorname{csch}^{-1}(z) = F_\infty(z) /; \left(\left(F_n(z) = -\frac{\pi i}{2} + 2 i \sqrt{-i (z-i)} \sum_{k=0}^{n} \frac{i^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right) (z-i)^k = \operatorname{csch}^{-1}(z) + \frac{2 i^n \left(\frac{1}{2}\right)_{n+1}}{(n+1)!} (z-i)^{n+1} \sqrt{-i (z-i)}\, F_{0\times1\times2}^{1\times1\times2}\left(\begin{matrix} n+\frac{5}{2}; \frac{1}{2}; 1, n+\frac{3}{2}; \\ ; \frac{3}{2}; n+2, n+\frac{5}{2}; \end{matrix} -1, i (z-i)\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.29.06.0050.01

$$\operatorname{csch}^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\, \pi \sqrt{-i (z-i)} \left(1 + \frac{5 i (z-i)}{12} - \frac{43 (z-i)^2}{160} + \ldots\right) + 2 i (z-i) \left(1 + \frac{5 i}{6} (z-i) - \frac{32}{45} (z-i)^2 + \ldots\right) /; (z \to i)$$

01.29.06.0051.01

$$\operatorname{csch}^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\, \pi \sqrt{-i (z-i)} \left(1 + \frac{5 i (z-i)}{12} - \frac{43 (z-i)^2}{160} + O\left((z-i)^3\right)\right) + 2 i (z-i) \left(1 + \frac{5 i}{6} (z-i) - \frac{32}{45} (z-i)^2 + O\left((z-i)^3\right)\right)$$

01.29.06.0052.01

$$\operatorname{csch}^{-1}(z)^2 = -\frac{\pi^2}{4} + 2 \pi \sqrt{-i (z-i)} \sum_{k=0}^{\infty} \frac{i^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right) (z-i)^k + 4 i (z-i) \left(\sum_{k=0}^{\infty} \frac{i^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right) (z-i)^k\right)^2 /; |z-i| < 2$$

01.29.06.0053.01

$$\operatorname{csch}^{-1}(z)^2 = -\frac{\pi^2}{4} + \pi \sqrt{2} \sqrt{-i(z-i)}\, F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix} \frac{3}{2}; \frac{1}{2}; \frac{1}{2}; \\ ; \frac{3}{2}; \frac{3}{2}; \end{matrix} -1, i(z-i)\right) + 2 i(z-i)\, F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix} \frac{3}{2}; \frac{1}{2}; \frac{1}{2}; \\ ; \frac{3}{2}; \frac{3}{2}; \end{matrix} -1, i(z-i)\right)^2$$

01.29.06.0054.01

$$\operatorname{csch}^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\, \pi \sqrt{-i (z-i)} (1 + O(z-i)) + 2 i (z-i) (1 + O(z-i))$$

01.29.06.0055.01

$$\operatorname{csch}^{-1}(z)^2 = F_\infty(z) /; \left(\left(F_n(z) = \left(-\frac{\pi i}{2} + 2 i \sqrt{-i (z-i)} \sum_{k=0}^{n} \frac{i^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right) (z-i)^k\right)^2 = \left(\operatorname{csch}^{-1}(z) + \frac{2 i^n \left(\frac{1}{2}\right)_{n+1}}{(n+1)!} (z-i)^{n+1} \sqrt{-i (z-i)}\, F_{0\times1\times2}^{1\times1\times2}\left(\begin{matrix} n+\frac{5}{2}; \frac{1}{2}; 1, n+\frac{3}{2}; \\ ; \frac{3}{2}; n+2, n+\frac{5}{2}; \end{matrix} -1, i (z-i)\right)\right)^2\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z == -i$

For the function itself

01.29.06.0009.02

$$\operatorname{csch}^{-1}(z) \propto \frac{i\pi}{2} - i\sqrt{2}\sqrt{i(z+i)}\left(1 - \frac{5i(z+i)}{12} - \frac{43(z+i)^2}{160} + \ldots\right) /; (z \to -i)$$

01.29.06.0056.01

$$\operatorname{csch}^{-1}(z) \propto \frac{i\pi}{2} - i\sqrt{2}\sqrt{i(z+i)}\left(1 - \frac{5i(z+i)}{12} - \frac{43(z+i)^2}{160} + O\left((z+i)^3\right)\right)$$

01.29.06.0010.01

$$\operatorname{csch}^{-1}(z) == \frac{i\pi}{2} - 2i\sqrt{i(z+i)}\sum_{k=0}^{\infty}\frac{(-i)^k}{k!}\left(\frac{1}{2}\right)_k {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right)(z+i)^k /; |z+i| < 1$$

01.29.06.0011.01

$$\operatorname{csch}^{-1}(z) == \frac{i\pi}{2} - i\sqrt{2}\sqrt{i(z+i)}\, F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2}; \frac{1}{2}; \frac{1}{2};\\ ; \frac{3}{2}; \frac{3}{2};\end{matrix}\, -1, 1 - iz\right)$$

01.29.06.0012.02

$$\operatorname{csch}^{-1}(z) \propto \frac{i\pi}{2} - \sqrt{2}\, i\sqrt{i(z+i)}\,(1 + O(z+i))$$

01.29.06.0057.01

$$\operatorname{csch}^{-1}(z) == F_\infty(z) /; \left(\left(F_n(z) == \frac{\pi i}{2} - 2i\sqrt{i(z+i)}\sum_{k=0}^{n}\frac{(-i)^k\left(\frac{1}{2}\right)_k}{k!}\, {}_2F_1\left(\frac{1}{2}, k+\frac{3}{2}; \frac{3}{2}; -1\right)(z+i)^k == \right.\right.$$
$$\left.\left.\operatorname{csch}^{-1}(z) + \frac{2(-i)^n\left(\frac{1}{2}\right)_{n+1}}{(n+1)!}(z+i)^{n+1}\sqrt{i(z+i)}\, F_{0\times1\times2}^{1\times1\times2}\left(\begin{matrix}n+\frac{5}{2}; \frac{1}{2}; 1, n+\frac{3}{2};\\ ; \frac{3}{2}; n+2, n+\frac{5}{2};\end{matrix}\, -1, -i(z+i)\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.29.06.0058.01

$$\operatorname{csch}^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\,\pi\sqrt{i(z+i)}\left(1 - \frac{5i(z+i)}{12} - \frac{43(z+i)^2}{160} + \ldots\right) - 2i(z+i)\left(1 - \frac{5i}{6}(z+i) - \frac{32}{45}(z+i)^2 + \ldots\right) /; (z \to -i)$$

01.29.06.0059.01

$$\operatorname{csch}^{-1}(z)^2 \propto$$
$$-\frac{\pi^2}{4} + \sqrt{2}\,\pi\sqrt{i(z+i)}\left(1 - \frac{5i(z+i)}{12} - \frac{43(z+i)^2}{160} + O\left((z+i)^3\right)\right) - 2i(z+i)\left(1 - \frac{5i}{6}(z+i) - \frac{32}{45}(z+i)^2 + O\left((z+i)^3\right)\right)$$

01.29.06.0060.01

$$\operatorname{csch}^{-1}(z)^2 = -\frac{\pi^2}{4} + 2\pi\sqrt{i(z+i)}\sum_{k=0}^{\infty}\frac{(-i)^k\left(\frac{1}{2}\right)_k}{k!}\,{}_2F_1\left(\frac{1}{2},k+\frac{3}{2};\frac{3}{2};-1\right)(z+i)^k - 4\,i(z+i)\left(\sum_{k=0}^{\infty}\frac{(-i)^k\left(\frac{1}{2}\right)_k}{k!}\,{}_2F_1\left(\frac{1}{2},k+\frac{3}{2};\frac{3}{2};-1\right)(z+i)^k\right)^2 \;/;\; |z+i|<2$$

01.29.06.0061.01

$$\operatorname{csch}^{-1}(z)^2 = -\frac{\pi^2}{4} + \pi\sqrt{2}\,\sqrt{i(z+i)}\;F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2};\frac{1}{2};\frac{1}{2};\\ ;\frac{3}{2};\frac{3}{2};\end{matrix}\;-1,-i(z+i)\right) - 2\,i(z+i)\,F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2};\frac{1}{2};\frac{1}{2};\\ ;\frac{3}{2};\frac{3}{2};\end{matrix}\;-1,-i(z+i)\right)^2$$

01.29.06.0062.01

$$\operatorname{csch}^{-1}(z)^2 \propto -\frac{\pi^2}{4} + \sqrt{2}\,\pi\sqrt{i(z+i)}\,(1+O(z+i)) - 2\,i\,(z+i)\,(1+O(z+i))$$

01.29.06.0063.01

$$\operatorname{csch}^{-1}(z)^2 = F_\infty(z) \;/;\; \left(\left(F_n(z) = \left(\frac{\pi i}{2} - 2\,i\sqrt{i(z+i)}\sum_{k=0}^{n}\frac{(-i)^k\left(\frac{1}{2}\right)_k}{k!}\,{}_2F_1\left(\frac{1}{2},k+\frac{3}{2};\frac{3}{2};-1\right)(z+i)^k\right)^2 = \left(\operatorname{csch}^{-1}(z) + \frac{2(-i)^n\left(\frac{1}{2}\right)_{n+1}}{(n+1)!}(z+i)^{n+1}\sqrt{i(z+i)}\;F_{0\times1\times2}^{1\times1\times2}\left(\begin{matrix}n+\frac{5}{2};\frac{1}{2};1,n+\frac{3}{2};\\ ;\frac{3}{2};n+2,n+\frac{5}{2};\end{matrix}\;-1,-i(z+i)\right)\right)^2\right)\bigwedge n\in\mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z = \infty$

For the function itself

01.29.06.0013.02

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{z} - \frac{1}{6z^3} + \frac{3}{40z^5} - \ldots \;/;\; |z|\to\infty$$

01.29.06.0064.01

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{z} - \frac{1}{6z^3} + \frac{3}{40z^5} + O\left(\frac{1}{z^7}\right)$$

01.29.06.0014.01

$$\operatorname{csch}^{-1}(z) = \sum_{k=0}^{\infty}\frac{(-1)^k\left(\frac{1}{2}\right)_k z^{-2k-1}}{(2k+1)\,k!} \;/;\; |z|>1$$

01.29.06.0015.01

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

01.29.06.0016.02

$$\operatorname{csch}^{-1}(z) \propto \frac{1}{z} + O\left(\frac{1}{z^3}\right)$$

01.29.06.0065.01

$$\operatorname{csch}^{-1}(z) == F_\infty(z) /; \left(\left(F_n(z) == \sum_{k=0}^{n} \frac{(-1)^k \left(\frac{1}{2}\right)_k z^{-2k-1}}{(2k+1)\,k!} == \frac{(-1)^n z^{-2n-3}}{2\sqrt{\pi}} \Gamma\left(n+\frac{3}{2}\right)^2 {}_3\tilde{F}_2\left(1, n+\frac{3}{2}, n+\frac{3}{2}; n+2, n+\frac{5}{2}; -\frac{1}{z^2}\right) + \operatorname{csch}^{-1}(z)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.29.06.0017.02

$$\operatorname{csch}^{-1}(z)^2 \propto \frac{1}{z^2} - \frac{1}{3z^4} + \frac{8}{45z^6} - \ldots /; |z| \to \infty$$

01.29.06.0066.01

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

01.29.06.0018.01

$$\operatorname{csch}^{-1}(z)^2 == \sum_{k=0}^{\infty} \frac{(-1)^k 2^{2k} k!^2 z^{-2k-2}}{(2k+1)!\,(k+1)} /; |z| > 1$$

01.29.06.0019.01

$$\operatorname{csch}^{-1}(z)^2 == \frac{1}{z^2} {}_3F_2\left(1, 1, 1; \frac{3}{2}, 2; -\frac{1}{z^2}\right)$$

01.29.06.0020.02

$$\operatorname{csch}^{-1}(z)^2 \propto \frac{1}{z^2} + O\left(\frac{1}{z^4}\right)$$

01.29.06.0067.01

$$\operatorname{csch}^{-1}(z)^2 == F_\infty(z) /; \left(\left(F_n(z) == \sum_{k=0}^{n} \frac{(-1)^k 2^{2k} k!^2 z^{-2k-2}}{(2k+1)!\,(k+1)} == \frac{1}{2} (-1)^n \sqrt{\pi}\, \Gamma(n+2)^2 z^{-2n-4} {}_3\tilde{F}_2\left(1, n+2, n+2; n+\frac{5}{2}, n+3; -\frac{1}{z^2}\right) + \operatorname{csch}^{-1}(z)^2\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Residue representations

01.29.06.0021.01

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

01.29.06.0022.01

$$\operatorname{csch}^{-1}(z) = \frac{z}{2\sqrt{\pi}}\sum_{j=1}^{\infty}\operatorname{res}_s\left(\frac{\Gamma\left(-s-\frac{1}{2}\right)^2\left(\frac{1}{z^2}\right)^{-s}}{\Gamma\left(\frac{1}{2}-s\right)}\,\Gamma(s+1)\right)(-j) /; |z| > 1$$

Integral representations

On the real axis

Of the direct function

01.29.07.0001.01

$$\operatorname{csch}^{-1}(z) = \int_z^{\infty}\frac{1}{\sqrt{t^2+1}\; t}\,dt /; \operatorname{Re}(z) > 0$$

01.29.07.0002.01

$$\operatorname{csch}^{-1}(z) = \int_{-\infty}^{z}\frac{1}{\sqrt{t^2+1}\; t}\,dt /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 0$$

01.29.07.0003.01

$$\operatorname{csch}^{-1}(z) = -\int_i^z\frac{1}{\sqrt{1+\frac{1}{z^2}}\; z^2}\,dz - \frac{\pi i}{2} /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) > 0$$

Contour integral representations

01.29.07.0004.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{\left(2\sqrt{\pi}\, z\right)2\pi i}\int_{\mathcal{L}}\frac{\Gamma(s)\,\Gamma\left(\frac{1}{2}-s\right)^2}{\Gamma\left(\frac{3}{2}-s\right)}\left(\frac{1}{z^2}\right)^{-s}ds; \left|\arg\left(z^{-2}\right)\right| < \pi$$

01.29.07.0005.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{\left(2\sqrt{\pi}\, z\right)2\pi i}\int_{\mathcal{L}}\Gamma(s)\,\Gamma\left(s+\frac{1}{2}\right)\Gamma\left(\frac{1}{2}-s\right)^2\left(1+\frac{1}{z^2}\right)^{-s}ds /; \left|\arg\left(1+z^{-2}\right)\right| < \pi$$

01.29.07.0006.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{\left(2\sqrt{\pi}\, z\right)2\pi i}\int_{\gamma-i\infty}^{\gamma+i\infty}\frac{\Gamma(s)\,\Gamma\left(\frac{1}{2}-s\right)^2}{\Gamma\left(\frac{3}{2}-s\right)}\left(\frac{1}{z^2}\right)^{-s}ds /; 0 < \gamma < \frac{1}{2} \bigwedge \left|\arg\left(z^{-2}\right)\right| < \pi$$

01.29.07.0007.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{\left(2\sqrt{\pi}\, z\right)2\pi i}\int_{\gamma-i\infty}^{\gamma+i\infty}\Gamma(s)\,\Gamma\left(s+\frac{1}{2}\right)\Gamma\left(\frac{1}{2}-s\right)^2\left(1+\frac{1}{z^2}\right)^{-s}ds /; 0 < \gamma < \frac{1}{2} \bigwedge \left|\arg\left(1+z^{-2}\right)\right| < \pi$$

Continued fraction representations

01.29.10.0001.01

$$\operatorname{csch}^{-1}(z) = \cfrac{z^{-1}\sqrt{1+z^{-2}}}{1+\cfrac{1\times 2\,z^{-2}}{3+\cfrac{1\times 2\,z^{-2}}{5+\cfrac{3\times 4\,z^{-2}}{7+\cfrac{3\times 4\,z^{-2}}{9+\cfrac{5\times 6\,z^{-2}}{11+\ldots}}}}}} \;/;\; i\,z \notin (-1,\,1)$$

01.29.10.0002.01

$$\operatorname{csch}^{-1}(z) = \frac{z^{-1}\sqrt{1+z^{-2}}}{1+\mathrm{K}_k\left(2\left(2\left\lfloor\frac{k+1}{2}\right\rfloor-1\right)\left\lfloor\frac{k+1}{2}\right\rfloor z^{-2},\,2\,k+1\right)_1^{\infty}} \;/;\; i\,z \notin (-1,\,1)$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

01.29.13.0001.01

$$z\left(z^2+1\right)w''(z)+\left(2\,z^2+1\right)w'(z) = 0 \;/;\; w(z) = c_1 + c_2\operatorname{csch}^{-1}(z)$$

01.29.13.0002.01

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

01.29.13.0003.01

$$\sqrt{1+\frac{1}{z^2}}\;z^2\,w'(z) = -1 \;/;\; w(z) = \operatorname{csch}^{-1}(z) \bigwedge w(i) = -\frac{i\,\pi}{2}$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

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

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

01.29.16.0001.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$

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

01.29.16.0007.01

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

01.29.16.0008.01

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

01.29.16.0003.01

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

Involving $\operatorname{csch}^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\operatorname{csch}^{-1}(a\,(b\,z^c)^m)$ and $\operatorname{csch}^{-1}(a\,b^m\,z^{m\,c})$

01.29.16.0002.01

$$\operatorname{csch}^{-1}(a\,(b\,z^c)^m) = \frac{(b\,z^c)^m}{b^m\,z^{m\,c}} \operatorname{csch}^{-1}(a\,b^m\,z^{m\,c}) \;/;\; 2\,m \in \mathbb{Z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{c\,z-1}}\right)$

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

01.29.16.0009.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\pi\,i}{2} + \operatorname{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.16.0010.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi\,i}{2} - \operatorname{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.16.0011.01

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

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

01.29.16.0012.01

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

01.29.16.0013.01

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

01.29.16.0014.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.16.0015.01

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

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

01.29.16.0016.01

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

01.29.16.0017.01

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

01.29.16.0018.01

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

01.29.16.0019.01

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

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

01.29.16.0020.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-z-1}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) > 0$$

01.29.16.0021.01

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

01.29.16.0022.01

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

01.29.16.0023.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{c\,z-1}}\right)$

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

01.29.16.0024.01

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

01.29.16.0025.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{i}{\sqrt{z}}\right) /; \operatorname{Im}(z) \le 0$$

01.29.16.0026.01

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

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

01.29.16.0027.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.16.0028.01

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

01.29.16.0029.01

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

01.29.16.0030.01

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

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

01.29.16.0031.01

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

01.29.16.0032.01

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

01.29.16.0033.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ (z \in \mathbb{R} \land z > 0)$$

01.29.16.0034.01

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

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

01.29.16.0035.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) > 0$$

01.29.16.0036.01

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

01.29.16.0037.01

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

01.29.16.0038.01

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

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

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

01.29.16.0039.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{i}{z}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.16.0040.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{i}{z}\right) /; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.16.0041.01

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

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

01.29.16.0042.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{i}{z}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.16.0043.01

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

01.29.16.0044.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{c\,z-1}}\right)$

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

01.29.16.0045.01

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

01.29.16.0046.01

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

01.29.16.0047.01

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

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

01.29.16.0048.01

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

01.29.16.0049.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{\pi i}{4}-\frac{1}{2}\operatorname{csch}^{-1}\left(\frac{i}{z}\right)\ /;\ \operatorname{Im}(z)\leq 0$$

01.29.16.0050.01

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

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

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

01.29.16.0051.01

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

01.29.16.0052.01

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

01.29.16.0053.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \operatorname{csch}^{-1}\left(\sqrt{z}\right)+\frac{\pi i}{2}\ /;\ (z\in\mathbb{R}\land z>0)$$

01.29.16.0054.01

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

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

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

01.29.16.0055.01

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

01.29.16.0056.01

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

01.29.16.0057.01

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

01.29.16.0058.01

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

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

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

01.29.16.0059.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \operatorname{csch}^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.29.16.0060.01

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

01.29.16.0061.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\operatorname{csch}^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(a) = 0$$

01.29.16.0062.01

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

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

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

01.29.16.0063.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > -1$$

01.29.16.0064.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \leq -1 \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.16.0065.01

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

$$\frac{i\pi\sqrt{z}}{4\sqrt{-i-z}}\sqrt{-\frac{i+z}{z}}\left(-\sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{1-iz}}\sqrt{1-iz}+1\right) + \frac{1}{2}\sqrt{-i-z}\sqrt{\frac{i}{z}}\sqrt{z}\sqrt{\frac{1}{1-iz}}\operatorname{csch}^{-1}(z)$$

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

01.29.16.0066.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1$$

01.29.16.0067.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) > 1 \bigvee \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.29.16.0068.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = \frac{i\pi\sqrt{2z}}{4\sqrt{i-z}}\sqrt{\frac{i-z}{2z}}\left(\sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{iz+1}}\sqrt{iz+1}+1\right) + \frac{1}{2}\sqrt{i-z}\sqrt{-\frac{i}{z}}\sqrt{z}\sqrt{\frac{1}{iz+1}}\operatorname{csch}^{-1}(z)$$

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

01.29.16.0069.01

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

01.29.16.0070.01

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

01.29.16.0071.01

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

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right)$ and $\operatorname{csch}^{-1}(i\,z)$

01.29.16.0072.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i\,z) - \frac{\pi\,i}{4} \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.16.0073.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(i\,z) + \frac{\pi\,i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.16.0074.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{4} - \frac{1}{2}\,i\operatorname{csch}^{-1}(i\,z)\right)$$

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

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

01.29.16.0075.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i+z}}\right) = \frac{\pi\,i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) > 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1$$

01.29.16.0076.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i+z}}\right) = -\frac{\pi\,i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) < -1 \bigvee -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.29.16.0077.01

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

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

01.29.16.0078.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-i}}\right) = -\frac{\pi\,i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \leq 0 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < 1$$

01.29.16.0079.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-i}}\right) = \frac{\pi\,i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Im}(z) \geq 1 \bigvee 0 < \arg(z) < \frac{\pi}{2}$$

01.29.16.0080.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-i}}\right) = \frac{i\pi\sqrt{-z}}{4\sqrt{z-i}}\sqrt{\frac{i-z}{z}}\left(\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{iz+1}}\sqrt{iz+1}+1\right)-\frac{1}{2}\sqrt{z-i}\sqrt{\frac{1}{iz+1}}\sqrt{-\frac{i}{z}}\sqrt{-z}\operatorname{csch}^{-1}(z)$$

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

01.29.16.0081.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(iz)+\frac{\pi i}{4}\ /;\ \operatorname{Im}(z)>0\lor(z\in\mathbb{R}\land z<-1)$$

01.29.16.0082.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(iz)-\frac{\pi i}{4}\ /;\ -\pi<\arg(z)\le 0\lor(z\in\mathbb{R}\land -1<z<0)$$

01.29.16.0083.01

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

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

01.29.16.0084.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(iz)-\frac{\pi i}{4}\ /;\ -\pi<\arg(z)\le 0$$

01.29.16.0085.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(iz)+\frac{\pi i}{4}\ /;\ 0<\arg(z)\le\pi$$

01.29.16.0086.01

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

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

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

01.29.16.0087.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{i+z}}\right) = -\frac{\pi i}{4}+\frac{1}{2}\operatorname{csch}^{-1}(z)\ /;\ \operatorname{Re}(z)\ge 0$$

01.29.16.0088.01

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

01.29.16.0089.01

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

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

01.29.16.0090.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{i-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Re}(z) > 0$$

01.29.16.0091.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{i-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Re}(z) \le 0$$

01.29.16.0092.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right)$ and $\operatorname{csch}^{-1}(i\,z)$

01.29.16.0093.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i\,z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0$$

01.29.16.0094.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(i\,z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \le 0$$

01.29.16.0095.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$ and $\operatorname{csch}^{-1}(i\,z)$

01.29.16.0096.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}(i\,z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \ge 0$$

01.29.16.0097.01

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

01.29.16.0098.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \sqrt{-\frac{1}{z}}\,\sqrt{z}\left(\frac{1}{2} i \operatorname{csch}^{-1}(i z) - \frac{\pi}{4}\right)$$

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

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

01.29.16.0099.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.16.0100.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.16.0101.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.16.0102.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.16.0103.01

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

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

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

01.29.16.0104.01

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

01.29.16.0105.01

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

01.29.16.0106.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi$$

01.29.16.0107.01

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

01.29.16.0108.01

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

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

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

01.29.16.0109.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /;\ \operatorname{Im}(z) > 0$$

01.29.16.0110.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /;\ \operatorname{Im}(z) < 0$$

01.29.16.0111.01

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

01.29.16.0112.01

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

01.29.16.0004.02

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

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

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

01.29.16.0113.01

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

01.29.16.0114.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.16.0115.01

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

01.29.16.0116.01

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

01.29.16.0117.01

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

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

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

01.29.16.0118.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + \operatorname{csch}^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.16.0119.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + \operatorname{csch}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.16.0120.01

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

01.29.16.0121.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.16.0122.01

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

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

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

01.29.16.0123.01

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

01.29.16.0124.01

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

01.29.16.0125.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.16.0126.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} - \operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.16.0127.01

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

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

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

01.29.16.0128.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{1+z^2}}\right) = 2\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; |\arg(z)| \le \frac{\pi}{4} \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi$$

01.29.16.0129.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{1+z^2}}\right) = -\frac{\pi\sqrt{2z^2+1}\sqrt{z^4+z^2}}{2\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}\left(\frac{\sqrt{-z^2}}{z} + i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}\,z}}\sqrt{1-i\sqrt{2}\,z} - i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}\,iz+1}}\sqrt{\sqrt{2}\,iz+1} + \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right) - \frac{2\sqrt{2z^2+1}\sqrt{z^4+z^2}}{\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{-z^2-1}}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

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

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

01.29.16.0130.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1+z^2}}\right) = 2\operatorname{csch}^{-1}(z) /; |z| \ge \sqrt{2} \bigwedge -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.16.0131.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1+z^2}}\right) = -2\operatorname{csch}^{-1}(z) /; |z| \ge \sqrt{2} \bigwedge \left(\frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}\right)$$

01.29.16.0132.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1+z^2}}\right) = \frac{\sqrt{-z^2-2}\,\sqrt{z^2+1}}{2\sqrt{1-iz}\,(-i+z)\left(-\frac{i}{z}\right)^{5/2}\sqrt{-(z^2+1)(z^2+2)}}\sqrt{\frac{i-z}{z}}\sqrt{\frac{z^2+1}{z^4}}\left(\pi\left(\sqrt{-\frac{1}{z^2}}\,z - \frac{z^3}{z^2+1}\sqrt{\frac{z^2+1}{z^4}}\sqrt{-\frac{z^2+1}{z^2}} + i\sqrt{\frac{-i\sqrt{2}+z}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{z}{-i\sqrt{2}+z}} - i\sqrt{-iz}\sqrt{\frac{i}{z}}\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{z}{i\sqrt{2}+z}}\right) + 4\operatorname{csch}^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1+z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1+z^2}-1}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.29.16.0133.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.16.0134.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1+z^2}-1}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.16.0135.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.29.16.0136.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1+z^2}-1}}\right) = \frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land i\,z < -1) \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.16.0137.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1+z^2}-1}}\right) = -\frac{1}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land i\,z > 1) \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.16.0138.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1+z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1+z^2}-1}\right)\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.29.16.0139.01

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

Involving $\operatorname{csch}^{-1}\left(1/z\sqrt{2z^2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(1/z\sqrt{2z^2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.29.16.0140.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2+1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2+1}-z}\right)$ and $\operatorname{csch}^{-1}(z)$

01.29.16.0141.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.16.0142.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = -\frac{\pi i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.16.0143.01

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

01.29.16.0144.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{\pi i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.16.0145.01

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

$$\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)\right) + \frac{\sqrt{-i z - 1}\,\sqrt{i z - 1}}{2\sqrt{z}}\sqrt{\frac{1}{z}}\,\sqrt{\frac{z^2}{z^2+1}}\operatorname{csch}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z \Big/ \left(\sqrt{z^2+1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2+1}-z\right)}\right)$ and $\operatorname{csch}^{-1}(z)$

01.29.16.0146.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(z) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1) \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.16.0147.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = -\frac{\pi\,i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.16.0148.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{\pi\,i}{2} - \frac{1}{2}\operatorname{csch}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.16.0149.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\operatorname{csch}^{-1}(z) - \frac{\pi\,i}{2} /; (z \in \mathbb{R} \land z < 0) \lor (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.16.0150.01

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

$$\sqrt{\frac{z}{\sqrt{z^2+1}-z}}\,\sqrt{\frac{\sqrt{z^2+1}-z}{z}}\left(\frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - 2\,i\sqrt{\frac{1}{z}}\,z - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 3\right)\right) + \right.$$

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

Products, sums, and powers of the direct function

Sums of the direct function

01.29.16.0005.01

$$\operatorname{csch}^{-1}(x) + \operatorname{csch}^{-1}(y) = \sinh^{-1}\left(\frac{1}{y}\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\sqrt{1+\frac{1}{y^2}}\right) /; x \in \mathbb{R} \bigwedge y \in \mathbb{R}$$

01.29.16.0151.01

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

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

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

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

01.29.16.0152.01

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

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

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

Differences of the direct function

01.29.16.0153.01

$$\operatorname{csch}^{-1}(x)-\operatorname{csch}^{-1}(y)=\sinh^{-1}\left(\frac{\sqrt{1+\frac{1}{y^2}}}{x}-\frac{\sqrt{1+\frac{1}{x^2}}}{y}\right)\,/;\,x\in\mathbb{R}\bigwedge y\in\mathbb{R}$$

01.29.16.0154.01

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

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

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

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

01.29.16.0155.01

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

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

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

Linear combinations of the direct function

01.29.16.0156.01

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

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

$$\left.\left\lfloor \frac{\pi-\operatorname{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.29.16.0157.01

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

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

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

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

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

$$-$$

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

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

$$\left.\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{1+\frac{1}{y^2}}+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor\right)\right)$$

Related transformations

Sums involving the direct function

Involving log(*z*)

01.29.16.0158.01

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

01.29.16.0159.01

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

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

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

$$-$$

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

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

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

01.29.16.0160.01

$$\operatorname{csch}^{-1}(x)+\sin^{-1}(y)=\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.29.16.0161.01

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

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

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

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

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

$$-$$

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

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

$$\left.\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor\right)$$

01.29.16.0162.01

$$\operatorname{csch}^{-1}(x)+i\sin^{-1}(y)=$$

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

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

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

01.29.16.0163.01

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

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

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

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

01.29.16.0164.01

$$\operatorname{csch}^{-1}(x)+\cos^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

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

01.29.16.0165.01

$$\operatorname{csch}^{-1}(x)+\cos^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\Bigg)$$

$$\pi+\frac{\pi}{2}$$

01.29.16.0166.01

$$\operatorname{csch}^{-1}(x)+i\cos^{-1}(y)=$$

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

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

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

01.29.16.0167.01

$$
\begin{aligned}
&\operatorname{csch}^{-1}(x)+i\cos^{-1}(y)=\operatorname{csch}^{-1}\left(\frac{(-1)^{-\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i y}{x}\right)}{\pi}\right\rfloor}}{\frac{\sqrt{1-y^2}}{x}-i\sqrt{1+\frac{1}{x^2}}\,y}\right)-\\
&\frac{1}{2}i\pi\left(-1+2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\sqrt{1-y^2}-i y\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i y}{x}\right)}{\pi}\right\rfloor}+\right.\\
&\left.2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\sqrt{1-y^2}-i y\right)}{2\pi}\right\rfloor-1\right)
\end{aligned}
$$

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

01.29.16.0168.01

$$
\begin{aligned}
&\operatorname{csch}^{-1}(x)+\tan^{-1}(y)=-2i\pi\left(\left\lfloor\frac{-\arg\left((i y+1)^{-\frac{i}{2}}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)(1-i y)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\right.\\
&\left.\left\lfloor\frac{\frac{1}{2}\operatorname{Re}(\log(i y+1))+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)(1-i y)^{i/2}\right)\right)}{2\pi}\right\rfloor\right)-\\
&2i\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left((1-i y)^{i/2}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(1-i y))}{2\pi}\right\rfloor\right)+\\
&\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)(1-i y)^{i/2}\,(i y+1)^{-\frac{i}{2}}\right)
\end{aligned}
$$

01.29.16.0169.01

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

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

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

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

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

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

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

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

$$-$$

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

$$\pi$$

01.29.16.0170.01

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

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

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

01.29.16.0171.01

$$\operatorname{csch}^{-1}(x)+i\tan^{-1}(y)=$$

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

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

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

01.29.16.0172.01

$$\operatorname{csch}^{-1}(x)+\cot^{-1}(y) = -2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)\right)}{2\,\pi}\right\rfloor\right) - 2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right) + \log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)$$

01.29.16.0173.01

$$\operatorname{csch}^{-1}(x)+\cot^{-1}(y) = -2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\right)\right)}{2\,\pi}\right\rfloor\right) - 2\,i\,\pi\left(\left\lfloor \frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{i/2}\right)+\pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right) + (-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\right)}{\pi}\right\rfloor - \left\lfloor -\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}\left(1-\frac{i}{y}\right)^{i/2}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{i/2}\left(1+\frac{i}{y}\right)^{-\frac{i}{2}}-1\right)}{2\,\pi}\right\rfloor}$$

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

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

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

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

$$-$$

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

$$\pi$$

01.29.16.0174.01

$$\operatorname{csch}^{-1}(x)+i\cot^{-1}(y)=-\frac{i\,x\sqrt{1+\frac{1}{y^2}}\;y\sqrt{-\frac{-x^2+2\,i\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2-1}{x^2\left(y^2+1\right)}}}{i\sqrt{1+\frac{1}{x^2}}\;x+y}\sinh^{-1}\left(\frac{i\sqrt{1+\frac{1}{x^2}}\;x-\frac{1}{y}}{x\sqrt{1+\frac{1}{y^2}}}\right)+$$

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

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

01.29.16.0175.01

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

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

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

01.29.16.0176.01

$$\operatorname{csch}^{-1}(x)+\csc^{-1}(y)=\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{-i}\right)-2\,i\,\pi$$

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

01.29.16.0177.01

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

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

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

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

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

$$-$$

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

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

$$\left.\left\lfloor\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor\right)\Bigg)$$

01.29.16.0178.01

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

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

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

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

01.29.16.0179.01

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

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

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

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

01.29.16.0180.01

$$\operatorname{csch}^{-1}(x) + \sec^{-1}(y) = -2 i \pi$$

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

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

01.29.16.0181.01

$$\operatorname{csch}^{-1}(x) + \sec^{-1}(y) = -2 i \pi$$

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

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

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

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

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

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

$$-$$

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

$$\pi+\frac{\pi}{2}$$

01.29.16.0182.01

$$\operatorname{csch}^{-1}(x) + i\sec^{-1}(y) = \frac{\sqrt{1+\frac{1}{x^2}}\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}\right)^2}}\sinh^{-1}\left(\frac{\sqrt{1-\frac{1}{y^2}}}{x}-\frac{i\sqrt{1+\frac{1}{x^2}}}{y}\right)+\frac{1}{2}i\pi\left(2-\frac{\sqrt{1+\frac{1}{x^2}}\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}\right)^2}}\right)-$$

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

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

01.29.16.0183.01

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

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

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

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

01.29.16.0184.01

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

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

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

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

01.29.16.0185.01

$$\operatorname{csch}^{-1}(x)+\sinh^{-1}(y)=$$

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

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

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

01.29.16.0186.01

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

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

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

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

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

01.29.16.0187.01

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

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

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

01.29.16.0188.01

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

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

01.29.16.0189.01

$$\operatorname{csch}^{-1}(x)+\coth^{-1}(y)=$$

$$-\frac{i\,x\sqrt{1-\frac{1}{y^2}}\;y\sqrt{-\frac{x^2+2\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2+1}{x^2\,(y^2-1)}}}{\sqrt{1+\frac{1}{x^2}}\;x+y}\sinh^{-1}\left(\frac{i\sqrt{1+\frac{1}{x^2}}\;x+\frac{i}{y}}{x\sqrt{1-\frac{1}{y^2}}}\right)+\frac{\pi\left(\sqrt{1+\frac{1}{x^2}}\;x+y\right)}{2\,x\sqrt{1-\frac{1}{y^2}}\;y\sqrt{-\frac{x^2+2\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2+1}{x^2\,(y^2-1)}}}+$$

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

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

01.29.16.0190.01

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

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

01.29.16.0191.01

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

Differences involving the direct function

Involving log(z)

01.29.16.0192.01

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

01.29.16.0193.01

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

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

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

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

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

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

01.29.16.0194.01

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

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

01.29.16.0195.01

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

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

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

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

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

$$-$$

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

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

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

01.29.16.0196.01

$$\operatorname{csch}^{-1}(x) - i \sin^{-1}(y) =$$

$$-\frac{i\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2} - \frac{i y}{x}\right)}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2} - \frac{i y}{x}\right)^2}} \sin^{-1}\!\left(\sqrt{1+\frac{1}{x^2}}\, y + \frac{i\sqrt{1-y^2}}{x}\right) + \frac{\pi i}{2}\left(1 - \frac{\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2} - \frac{i y}{x}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2} - \frac{i y}{x}\right)^2}}\right) +$$

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

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

01.29.16.0197.01

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

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

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

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

01.29.16.0198.01

$$\operatorname{csch}^{-1}(x)-\cos^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)-\frac{\pi}{2}$$

01.29.16.0199.01

$$\operatorname{csch}^{-1}(x)-\cos^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\operatorname{Re}\left(\log\left(i\,y+\sqrt{1-y^2}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)+$$
$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(-i\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)\right)}{2\,\pi}\right\rfloor}$$
$$\operatorname{csch}^{-1}\left(\frac{2\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}}{\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^2\left(i\,y+\sqrt{1-y^2}\right)^{-2\,i}-1}\right)-$$
$$\frac{1}{2}\,i\,(-1)^{-\left\lfloor-\frac{\arg\left(-i\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}-1\right)\right)}{2\,\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(i\,y+\sqrt{1-y^2}\right)^{-i}\right)}{\pi}\right\rfloor}$$

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

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

$$-$$

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

$$\left.\right)$$

$$\pi-\frac{\pi}{2}$$

01.29.16.0200.01

$$\operatorname{csch}^{-1}(x) - i\cos^{-1}(y) = \frac{i\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)}{\sqrt{\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)^2}} \sin^{-1}\left(\sqrt{1+\frac{1}{x^2}}\,y - \frac{i\sqrt{1-y^2}}{x}\right) - \frac{\pi i\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)}{2\sqrt{\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)^2}} - \pi i\left(\frac{\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}}{\sqrt{\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)^2}} + 1\right)\left\lfloor \frac{-\arg\left(\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\right) - \arg\left(i y + \sqrt{1-y^2}\right) + \pi}{2\pi} \right\rfloor + i\pi\left(1 - \frac{\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}}{\sqrt{\left(\frac{i y}{x} + \sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)^2}}\right)\left\lfloor \frac{\arg\left(\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\right) + \arg\left(i y + \sqrt{1-y^2}\right)}{2\pi} \right\rfloor$$

01.29.16.0201.01

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

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

01.29.16.0202.01

$$\operatorname{csch}^{-1}(x)-\tan^{-1}(y)=$$

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

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

$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(i\,y+1))}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)(1-i\,y)^{-\frac{i}{2}}\,(i\,y+1)^{i/2}\right)$$

01.29.16.0203.01

$$\operatorname{csch}^{-1}(x)-\tan^{-1}(y)=$$

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

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)(1-i\,y)^{-\frac{i}{2}}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}(\log(i\,y+1))}{2\,\pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\pi$$

01.29.16.0204.01

$$\operatorname{csch}^{-1}(x) - i\tan^{-1}(y) = \frac{i\,x\sqrt{-\frac{\left(i\sqrt{1+\frac{1}{x^2}}\,x\,y-1\right)^2}{x^2\,(y^2+1)}}\,\sqrt{y^2+1}}{i\sqrt{1+\frac{1}{x^2}}\,x\,y-1}\sinh^{-1}\left(\frac{i\sqrt{1+\frac{1}{x^2}}\,x+y}{x\sqrt{y^2+1}}\right) + \frac{\pi\left(1-i\sqrt{1+\frac{1}{x^2}}\,x\,y\right)}{2\,x\sqrt{-\frac{\left(i\sqrt{1+\frac{1}{x^2}}\,x\,y-1\right)^2}{x^2\,(y^2+1)}}\,\sqrt{y^2+1}} + i\,\pi\left(1-\frac{i\left(1-i\sqrt{1+\frac{1}{x^2}}\,x\,y\right)}{x\sqrt{-\frac{\left(i\sqrt{1+\frac{1}{x^2}}\,x\,y-1\right)^2}{x^2\,(y^2+1)}}\,\sqrt{y^2+1}}\right)\left\lfloor\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)}{2\,\pi}\right\rfloor - \pi\,i\left(\frac{i\sqrt{y^2+1}\,\sqrt{-\frac{\left(i\sqrt{1+\frac{1}{x^2}}\,x\,y-1\right)^2}{x^2\,(y^2+1)}}\,x}{i\sqrt{1+\frac{1}{x^2}}\,x\,y-1}+1\right)\left\lfloor-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\frac{i+y}{\sqrt{y^2+1}}\right)-\pi}{2\,\pi}\right\rfloor$$

01.29.16.0205.01

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

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

01.29.16.0206.01

$$\operatorname{csch}^{-1}(x)-\cot^{-1}(y)=$$
$$-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)-$$
$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{i/2}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)\right)}{2\,\pi}\right\rfloor+\right.$$
$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)$$

01.29.16.0207.01

$$\operatorname{csch}^{-1}(x)-\cot^{-1}(y)=$$
$$-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\operatorname{Re}\left(\log\left(1-\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)-$$
$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{i/2}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\right.$$
$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Re}\left(\log\left(1+\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right)+$$
$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}-1\right)}{2\,\pi}\right\rfloor}$$
$$\operatorname{csch}^{-1}\left(\frac{2\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(1-\frac{i}{y}\right)^{-\frac{i}{2}}\left(1+\frac{i}{y}\right)^{i/2}}{\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^2\left(1-\frac{i}{y}\right)^{-i}\left(1+\frac{i}{y}\right)^{i}-1}\right)-$$

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

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

$$-$$

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

01.29.16.0208.01

$$\operatorname{csch}^{-1}(x) - i\cot^{-1}(y) = \frac{i\,x\sqrt{1+\frac{1}{y^2}}\;y\sqrt{-\frac{-x^2-2\,i\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2-1}{x^2\left(y^2+1\right)}}}{i\sqrt{1+\frac{1}{x^2}}\;x-y}\sinh^{-1}\left(\frac{i\sqrt{1+\frac{1}{x^2}}\;x+\frac{1}{y}}{x\sqrt{1+\frac{1}{y^2}}}\right)+$$

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

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

01.29.16.0209.01

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

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

01.29.16.0210.01

$$\operatorname{csch}^{-1}(x)-\csc^{-1}(y)=\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i}\right)-2\,i\,\pi$$

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

01.29.16.0211.01

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

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

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

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

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

$$-$$

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

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

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

01.29.16.0212.01

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

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

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

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

01.29.16.0213.01

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

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

01.29.16.0214.01

$$\operatorname{csch}^{-1}(x) - \sec^{-1}(y) = -2\, i\, \pi \left(\left\lfloor \frac{-\arg\left(\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\right) - \arg\left(\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) + \pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)\right) + \pi}{2\,\pi}\right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right) + \log\left(\left(\sqrt{1+\frac{1}{x^2}} + \frac{1}{x}\right)\left(\sqrt{1-\frac{1}{y^2}} + \frac{i}{y}\right)^{-i}\right) - \frac{\pi}{2}$$

01.29.16.0215.01

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

$$\left.\left\lfloor\frac{\operatorname{Re}\left(\log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\Bigg)$$

$$\pi-\frac{\pi}{2}$$

01.29.16.0216.01

$$\operatorname{csch}^{-1}(x)-i\sec^{-1}(y)=$$

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

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

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

01.29.16.0217.01

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

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

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

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

01.29.16.0218.01

$$\begin{aligned}
&\operatorname{csch}^{-1}(x)-\sinh^{-1}(y)=-\frac{\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)^2}}\sinh^{-1}\left(\sqrt{1+\frac{1}{x^2}}\,y-\frac{\sqrt{y^2+1}}{x}\right)+\\
&\quad i\,\pi\left\lfloor\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\sqrt{y^2+1}-y\right)}{2\,\pi}\right\rfloor\left(1-\frac{\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)^2}}\right)+\\
&\quad \frac{1}{2}\,i\,\pi\left(1-\frac{\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)^2}}\right)-\\
&\quad \pi\,i\left(\frac{\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}}{\sqrt{\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)^2}}+1\right)\left\lfloor\frac{-\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)-\arg\left(\sqrt{y^2+1}-y\right)+\pi}{2\,\pi}\right\rfloor
\end{aligned}$$

01.29.16.0219.01

$$\begin{aligned}
&\operatorname{csch}^{-1}(x)-\sinh^{-1}(y)=\\
&\quad \operatorname{csch}^{-1}\left(\frac{(-1)^{-\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)}{\pi}\right\rfloor}}{\frac{\sqrt{y^2+1}}{x}-\sqrt{1+\frac{1}{x^2}}\,y}\right)+\frac{1}{2}\,i\,\pi\left(2\left(-1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(y+\sqrt{y^2+1}\right)+\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)}{2\,\pi}\right\rfloor+\right.\\
&\quad\left.(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{y^2+1}-\frac{y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(y+\sqrt{y^2+1}\right)+\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)}{2\,\pi}\right\rfloor-1\right)
\end{aligned}$$

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

01.29.16.0220.01

$$\begin{aligned}
&\operatorname{csch}^{-1}(x)-\cosh^{-1}(y)=\operatorname{csch}^{-1}\left(\frac{i\,(-1)^{-\left\lfloor \frac{1}{2}-\frac{\arg\left(i\sqrt{1+\frac{1}{x^2}}\,\sqrt{y-1}\,\sqrt{y+1}-\frac{i\,y}{x}\right)}{\pi}\right\rfloor}}{\sqrt{1+\frac{1}{x^2}}\,y-\frac{\sqrt{y-1}\,\sqrt{y+1}}{x}}\right)+\frac{1}{2}\,i\,\pi\left(\frac{1}{2}\left(1-(-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi}\right\rfloor}\right)\right.\\
&\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i\,y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i\,y}{x}\right)}{\pi}\right\rfloor}+\right.\\
&\left.2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}-\frac{i\,y}{x}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)-\\
&\frac{1}{2}\left(1+(-1)^{-\left\lfloor -\frac{\arg(1-y)}{2\pi}\right\rfloor}\right)\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,y}{x}+\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor+\right.\\
&\left.\left.(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,y}{x}+\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}+2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\frac{i\,y}{x}+\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-y^2}\right)}{\pi}\right\rfloor}\right)\left\lfloor\frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(i\,y+\sqrt{1-y^2}\right)}{2\pi}\right\rfloor\right)\right)
\end{aligned}$$

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

01.29.16.0221.01

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

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

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

01.29.16.0222.01

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

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

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

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

01.29.16.0223.01

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

$$\frac{i\,x\sqrt{1-\frac{1}{y^2}}\;y\sqrt{-\frac{x^2-2\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2+1}{x^2\left(y^2-1\right)}}}{\sqrt{1+\frac{1}{x^2}}\;x-y}\sinh^{-1}\left(\frac{i\sqrt{1+\frac{1}{x^2}}\;x-\frac{i}{y}}{x\sqrt{1-\frac{1}{y^2}}}\right)-\frac{\pi\left(\sqrt{1+\frac{1}{x^2}}\;x-y\right)}{2\,x\sqrt{1-\frac{1}{y^2}}\;y\sqrt{-\frac{x^2-2\sqrt{1+\frac{1}{x^2}}\;y\,x+y^2+1}{x^2\left(y^2-1\right)}}}+$$

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

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

01.29.16.0224.01

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

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

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

01.29.16.0225.01

$$
\begin{aligned}
&\operatorname{csch}^{-1}(x)-\operatorname{sech}^{-1}(y)=\operatorname{csch}^{-1}\left(\frac{i\,(-1)^{-\left\lfloor \frac{1}{2}-\frac{\arg\left(i\sqrt{1+\frac{1}{x^2}}\,\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}-\frac{i}{x\,y}\right)}{\pi}\right\rfloor}}{\frac{\sqrt{1+\frac{1}{x^2}}}{y}-\frac{\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}}{x}}\right)+\frac{1}{2}\,i\,\pi\left(\frac{1}{2}\left(1-(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\right.\\
&\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}\right)}{\pi}\right\rfloor}+\right.\\
&\left.2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}-\frac{i}{x\,y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}-\frac{1}{x}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)-\frac{1}{2}\left(1+(-1)^{-\left\lfloor -\frac{\arg\left(1-\frac{1}{y}\right)}{2\pi}\right\rfloor}\right)\\
&\left(2\left(-1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}+\frac{i}{x\,y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}+\frac{i}{x\,y}\right)}{\pi}\right\rfloor}+\right.\\
&\left.\left.2\left(1+(-1)^{\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}\,\sqrt{1-\frac{1}{y^2}}+\frac{i}{x\,y}\right)}{\pi}\right\rfloor}\right)\left\lfloor \frac{1}{2}-\frac{\arg\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)+\arg\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)}{2\pi}\right\rfloor\right)\right)
\end{aligned}
$$

Linear combinations involving the direct function

Involving log(z)

01.29.16.0226.01

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

01.29.16.0227.01

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

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

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

$$-$$

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

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

$$\left. \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}(b \log(y))}{2\pi} \right\rfloor \right)$$

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

01.29.16.0228.01

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

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

$$\left. \left\lfloor \frac{\operatorname{Re}\left(b \log\left(i\, y+\sqrt{1-y^2}\right)\right)+\pi}{2\, \pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\, \pi} \right\rfloor \right)$$

01.29.16.0229.01

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

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

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

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

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

$$-$$

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

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

$$\left.\left.\left\lfloor \frac{\operatorname{Re}\left(b \log\left(i y+\sqrt{1-y^2}\right)\right)+\pi}{2\pi}\right\rfloor+\left\lfloor \frac{\pi-\operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor\right)\right)$$

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

01.29.16.0230.01

$$a\,\operatorname{csch}^{-1}(x)+b\cos^{-1}(y)=$$

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Re}\left(b\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(i\,y+\sqrt{1-y^2}\right)^{i\,b}\right)$$

01.29.16.0231.01

$$a\,\operatorname{csch}^{-1}(x)+b\cos^{-1}(y)=$$

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Re}\left(b\log\left(i\,y+\sqrt{1-y^2}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

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

$$\operatorname{csch}^{-1}\left(\frac{2\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(i\,y+\sqrt{1-y^2}\right)^{i\,b}}{\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^{2\,a}\left(i\,y+\sqrt{1-y^2}\right)^{2\,i\,b}-1}\right)-$$

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

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

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

$$-$$

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

$$\Bigg)$$

$$\pi$$

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

01.29.16.0232.01

$$a\,\mathrm{csch}^{-1}(x)+b\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\,\mathrm{Re}(b\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-$$
$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\right)-\arg\left((1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Re}(b\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+$$
$$\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\,(i\,y+1)^{-\frac{1}{2}(i\,b)}\right)$$

01.29.16.0233.01

$$a\,\mathrm{csch}^{-1}(x)+b\tan^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\,\mathrm{Re}(b\log(i\,y+1))+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-$$
$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\right)-\arg\left((1-i\,y)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Re}(b\log(1-i\,y))}{2\,\pi}\right\rfloor\right)+$$
$$(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\,(i\,y+1)^{-\frac{1}{2}(i\,b)}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}\,(i\,y+1)^{-\frac{1}{2}(i\,b)}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left((i\,y+1)^{-\frac{1}{2}(i\,b)}\,(-i)\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-i\,y)^{\frac{i\,b}{2}}-1\right)}{2\,\pi}\right\rfloor}$$

$$\operatorname{csch}^{-1}\left(\frac{2\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a (1-i\,y)^{\frac{i\,b}{2}}\,(i\,y+1)^{-\frac{1}{2}(i\,b)}}{\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^{2a}(1-i\,y)^{i\,b}\,(i\,y+1)^{-i\,b}-1}\right)-$$

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

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

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

$$-$$

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

$$\pi$$

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

01.29.16.0234.01

$$a\,\mathrm{csch}^{-1}(x)+b\cot^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\,\mathrm{Re}\left(b\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\right)-\arg\left(\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Re}\left(b\log\left(1-\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}\right)$$

01.29.16.0235.01

$$a\,\mathrm{csch}^{-1}(x)+b\cot^{-1}(y)=-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\frac{1}{2}\,\mathrm{Re}\left(b\log\left(1+\frac{i}{y}\right)\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)-2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\right)-\arg\left(\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Re}\left(b\log\left(1-\frac{i}{y}\right)\right)}{2\,\pi}\right\rfloor\right)+(-1)^{\left\lfloor\frac{1}{2}-\frac{\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}\right)}{\pi}\right\rfloor-\left\lfloor-\frac{\arg\left(-i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}-1\right)}{2\,\pi}+\frac{1}{2}-\frac{\arg\left(i\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{i}{y}\right)^{\frac{i\,b}{2}}\left(1+\frac{i}{y}\right)^{-\frac{1}{2}(i\,b)}-1\right)}{2\,\pi}\right\rfloor}$$

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

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

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

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

$$-$$

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

$$\left.\vphantom{\frac{1}{2}}\right)$$

$$\pi$$

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

01.29.16.0236.01

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

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2 \pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)^{i b}\right)$$

01.29.16.0237.01

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2 \pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Re}\left(b \log\left(\sqrt{1-\frac{1}{y^2}}+\frac{i}{y}\right)\right)}{2 \pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\pi$$

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

01.29.16.0238.01

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

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(b \log\left(y+\sqrt{y^2+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor\right)$$

01.29.16.0239.01

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

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

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

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

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

$$-$$

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

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

$$\left. \left. \left\lfloor \frac{\pi - \operatorname{Im}\left(b \log\left(y+\sqrt{y^2+1}\right)\right)}{2\pi} \right\rfloor + \left\lfloor \frac{\pi - \operatorname{Im}\left(a \log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi} \right\rfloor \right) \right)$$

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

01.29.16.0240.01

$$a\,\mathrm{csch}^{-1}(x) + b\cosh^{-1}(y) =$$
$$\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a \left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right) - 2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)^b\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\right)+\pi}{2\,\pi}\right\rfloor + \right.$$
$$\left.\left\lfloor\frac{\pi-\mathrm{Im}\left(b\log\left(y+\sqrt{y-1}\,\sqrt{y+1}\right)\right)}{2\,\pi}\right\rfloor + \left\lfloor\frac{\pi-\mathrm{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.29.16.0241.01

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

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

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

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

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

$$-$$

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

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(y+\sqrt{y-1}\sqrt{y+1}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor\right)$$

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

01.29.16.0242.01

$$a\,\mathrm{csch}^{-1}(x)+b\tanh^{-1}(y)=$$

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

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left((y+1)^{b/2}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-y)^{-\frac{b}{2}}\right)+\pi}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Im}(b\log(y+1))}{2\,\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-y)^{-\frac{b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-y)^{-\frac{b}{2}}\,(y+1)^{b/2}\right)$$

01.29.16.0243.01

$$a\,\mathrm{csch}^{-1}(x)+b\tanh^{-1}(y)=$$

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

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

$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\,\mathrm{Im}(b\log(y+1))}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\mathrm{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a(1-y)^{-\frac{b}{2}}\right)\right)}{2\,\pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\pi$$

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

01.29.16.0244.01

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

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

$$2\,i\,\pi\left(\left\lfloor\frac{-\arg\left(\left(1+\frac{1}{y}\right)^{b/2}\right)-\arg\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)+\pi}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Im}\left(b\log\left(1+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor+\right.$$

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi}\right\rfloor\right)+\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\left(1+\frac{1}{y}\right)^{b/2}\right)$$

01.29.16.0245.01

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

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

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

$$\left.\left\lfloor\frac{\pi-\frac{1}{2}\operatorname{Im}\left(b\log\left(1+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(\log\left(\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)^a\left(1-\frac{1}{y}\right)^{-\frac{b}{2}}\right)\right)}{2\pi}\right\rfloor\right)+$$

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

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

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

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

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

$$-$$

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

$$\left.\right)$$

$$\pi$$

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

01.29.16.0246.01

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

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

$$\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\,\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)\right)}{2\,\pi}\right\rfloor\right)$$

01.29.16.0247.01

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

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

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

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

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

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

$$-$$

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

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

$$\left.\left.\left\lfloor\frac{\pi-\operatorname{Im}\left(a\log\left(\sqrt{1+\frac{1}{x^2}}+\frac{1}{x}\right)\right)}{2\pi}\right\rfloor+\left\lfloor\frac{\pi-\operatorname{Im}\left(b\log\left(\sqrt{\frac{1}{y}-1}\,\sqrt{1+\frac{1}{y}}+\frac{1}{y}\right)\right)}{2\pi}\right\rfloor\right)\right)$$

Identities

Functional identities

01.29.17.0001.01

$$\left(z_1^2-z_2^2\right)^2\operatorname{csch}^4(w(z_1)+w(z_2))-2\,z_1^2\,z_2^2\left(z_1^2+z_2^2+2\right)\operatorname{csch}^2(w(z_1)+w(z_2))+z_1^4\,z_2^4=0\;/;\;w(z)=\operatorname{csch}^{-1}(z)$$

Complex characteristics

Real part

01.29.19.0001.01

$$\operatorname{Re}\left(\operatorname{csch}^{-1}(x+i\,y)\right)=\log\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{\left(x^2+y^2\right)^2}+1,\,-\frac{2\,x\,y}{\left(x^2+y^2\right)^2}\right)\right)\sqrt[4]{\frac{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}{\left(x^2+y^2\right)^2}}+\frac{x}{x^2+y^2}\right)^2+\right.}\right.$$

$$\left.\left.\overline{\left(\frac{y}{x^2+y^2}-\sqrt[4]{\frac{x^4+2\left(y^2+1\right)x^2+\left(y^2-1\right)^2}{\left(x^2+y^2\right)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{\left(x^2+y^2\right)^2}+1,\,-\frac{2\,x\,y}{\left(x^2+y^2\right)^2}\right)\right)\right)^2\right)}\right)$$

Imaginary part

01.29.19.0002.01

$$\operatorname{Im}\left(\operatorname{csch}^{-1}(x+i\,y)\right) = \tan^{-1}\left(\frac{(x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x}{x^2+y^2},\right.$$
$$\left.\frac{(x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y}{x^2+y^2}\right)$$

Absolute value

01.29.19.0003.01

$$\left|\operatorname{csch}^{-1}(x+i\,y)\right| = \sqrt{\left(\tan^{-1}\left(\frac{1}{x^2+y^2}\left((x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x\right),\,\frac{1}{x^2+y^2}\right.\right.}$$
$$\left.\left.\left((x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y\right)\right)^2+\right.$$
$$\log^2\left(\sqrt{\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+\frac{x}{x^2+y^2}\right)^2+}\right.$$
$$\left.\left.\overline{\left(\frac{y}{x^2+y^2}-\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\right)^2}\right)\right)$$

Argument

01.29.19.0004.01

$$\arg\left(\operatorname{csch}^{-1}(x+i\,y)\right) = \tan^{-1}\left(\log\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}} + \frac{x}{x^2+y^2}\right)\text{^}2 + \left(\frac{y}{x^2+y^2} - \sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\right)\text{^}2\right)}\right),\right.$$
$$\left.\tan^{-1}\left(\frac{(x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x}{x^2+y^2},\right.\right.$$
$$\left.\left.\frac{(x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y}{x^2+y^2}\right)\right)$$

Conjugate value

01.29.19.0005.01

$$\overline{\operatorname{csch}^{-1}(x+i\,y)} = \log\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}} + \frac{x}{x^2+y^2}\right)^2 + \left(\frac{y}{x^2+y^2} - \sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\right)^2\right)}\right) -$$
$$i\tan^{-1}\left(\frac{1}{x^2+y^2}\left((x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x\right),\right.$$
$$\left.\frac{1}{x^2+y^2}\left((x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,\, -\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y\right)\right)$$

Signum value

01.29.19.0006.01

$$\operatorname{sgn}\left(\operatorname{csch}^{-1}(x+i\,y)\right) = \left(i\tan^{-1}\left(\frac{1}{x^2+y^2}\left((x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x\right),\right.\right.$$
$$\left.\frac{1}{x^2+y^2}\left((x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y\right)\right)+$$
$$\log\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+\frac{x}{x^2+y^2}\right)^2+\right.}\right.$$
$$\left.\left.\left.\left(\frac{y}{x^2+y^2}-\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\right)^2\right)\right)\right)\Bigg/$$
$$\left(\sqrt{\left(\tan^{-1}\left(\frac{1}{x^2+y^2}\left((x^2+y^2)\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+x\right),\right.\right.}\right.$$
$$\left.\frac{1}{x^2+y^2}\left((x^2+y^2)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)-y\right)\right)^2+$$
$$\log^2\left(\sqrt{\left(\left(\cos\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}+\frac{x}{x^2+y^2}\right)^2+\right.}\right.$$
$$\left.\left.\left.\left.\left(\frac{y}{x^2+y^2}-\sqrt[4]{\frac{x^4+2\,(y^2+1)\,x^2+(y^2-1)^2}{(x^2+y^2)^2}}\,\sin\left(\frac{1}{2}\tan^{-1}\left(\frac{x^2-y^2}{(x^2+y^2)^2}+1,-\frac{2\,x\,y}{(x^2+y^2)^2}\right)\right)\right)^2\right)\right)\right)\right)$$

Differentiation

Low-order differentiation

01.29.20.0001.01

$$\frac{\partial \operatorname{csch}^{-1}(z)}{\partial z} = -\frac{1}{\sqrt{1+\frac{1}{z^2}}\;z^2}$$

01.29.20.0002.01

$$\frac{\partial^2 \operatorname{csch}^{-1}(z)}{\partial z^2} = \frac{2 z^2 + 1}{\sqrt{1 + \frac{1}{z^2}}\; z^3 \left(z^2 + 1\right)}$$

Symbolic differentiation

01.29.20.0005.01

$$\frac{\partial^n \operatorname{csch}^{-1}(z)}{\partial z^n} = \delta_n \operatorname{csch}^{-1}(z) - \frac{z^{1-3n}}{\left(1 + \frac{1}{z^2}\right)^{n-\frac{1}{2}}} \sum_{j=0}^{n-1} \sum_{k=0}^{-j+n-1} \frac{\left(\left(\frac{1}{2}\right)_j (-j-k)_j \left(2(j+k) - n + 2\right)_{2(-j-k+n-1)}\right) 2^{2(j+k)-n+1} z^{2k} \left(2 z^2 + 1\right)^{j-k} \left(z^2 + 1\right)^{-j+n-1}}{(j-k)!\,(-j-k+n-1)!} \;/;\; n \in \mathbb{N}$$

01.29.20.0003.02

$$\frac{\partial^n \operatorname{csch}^{-1}(z)}{\partial z^n} = (-1)^n z^{-n-1} n!\; {}_3F_2\left(\frac{1}{2}, \frac{n}{2} + \frac{1}{2}, \frac{n}{2} + 1; 1, \frac{3}{2}; -\frac{1}{z^2}\right) \;/;\; n \in \mathbb{N}$$

Fractional integro-differentiation

01.29.20.0004.01

$$\frac{\partial^\alpha \operatorname{csch}^{-1}(z)}{\partial z^\alpha} = 2^{\alpha-3} \sqrt{\pi} \sqrt{\frac{1}{z^2}}\; z^{3-\alpha}\; {}_4\tilde{F}_3\left(1, 1, \frac{3}{2}, \frac{3}{2}; 2, \frac{3-\alpha}{2}, \frac{4-\alpha}{2}; -z^2\right) + \frac{z^{1-\alpha}}{2\,\Gamma(1-\alpha)\sqrt{\frac{1}{z^2}}} \left(\log\left(\frac{4}{z^2}\right) + 2\,\psi(1-\alpha) + 2\,\gamma\right)$$

Integration

Indefinite integration

Involving only one direct function

01.29.21.0001.01

$$\int \operatorname{csch}^{-1}(b + a z)\, dz = \frac{1}{a}\left((b + a z) \operatorname{csch}^{-1}(b + a z) + \log\left((b + a z)\left(\sqrt{\frac{(b + a z)^2 + 1}{(b + a z)^2}} + 1\right)\right)\right)$$

01.29.21.0002.01

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

01.29.21.0003.01

$$\int \operatorname{csch}^{-1}(z)\, dz = z \operatorname{csch}^{-1}(z) + \log\left(\left(\sqrt{1 + \frac{1}{z^2}} + 1\right) z\right)$$

Involving one direct function and elementary functions

Involving power function

Involving power

Linear argument

01.29.21.0004.01

$$\int z^{\alpha-1}\operatorname{csch}^{-1}(a\,z)\,dz = \frac{z^{\alpha}}{\alpha^2}\left(\alpha\operatorname{csch}^{-1}(a\,z) + \frac{a\,z}{\sqrt{a^2\,z^2+1}}\sqrt{1+\frac{1}{a^2\,z^2}}\;{}_2F_1\!\left(\frac{\alpha}{2},\frac{1}{2};\frac{\alpha}{2}+1;-a^2\,z^2\right)\right)$$

01.29.21.0005.01

$$\int z^{\alpha-1}\operatorname{csch}^{-1}(z)\,dz = \frac{\operatorname{csch}^{-1}(z)\,z^{\alpha}}{\alpha} + \frac{z^{\alpha-1}\sqrt{z^2+1}}{\sqrt{1+\frac{1}{z^2}}\;\alpha^2}\;{}_2F_1\!\left(\frac{\alpha}{2},\frac{1}{2};\frac{\alpha}{2}+1;-z^2\right)$$

01.29.21.0006.01

$$\int \frac{\operatorname{csch}^{-1}(a\,z)}{\sqrt{z}}\,dz = \frac{2}{a^2\,z^2+1}\left(\sqrt{z}\,\left(a^2\,z^2+1\right)\operatorname{csch}^{-1}(a\,z) - 2\sqrt{i\,a}\;\sqrt{1+\frac{1}{a^2\,z^2}}\;z\sqrt{a^2\,z^2+1}\;F\!\left(i\sinh^{-1}\!\left(\sqrt{i\,a}\;\sqrt{z}\right)\middle|-1\right)\right)$$

01.29.21.0007.01

$$\int z\operatorname{csch}^{-1}(b+a\,z)\,dz = \frac{1}{2}\left(z^2\operatorname{csch}^{-1}(b+a\,z) + \frac{b+a\,z}{a^2}\sqrt{\frac{b^2+2\,a\,z\,b+a^2\,z^2+1}{(b+a\,z)^2}} - \frac{b^2}{a^2}\operatorname{csch}^{-1}(b+a\,z) - \frac{2\,b}{a^2}\log\!\left(2\,(b+a\,z)\left(\sqrt{\frac{b^2+2\,a\,z\,b+a^2\,z^2+1}{(b+a\,z)^2}}+1\right)\right)\right)$$

01.29.21.0008.01

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

01.29.21.0009.01

$$\int \frac{\operatorname{csch}^{-1}(a z+b)}{z}\, dz = \operatorname{csch}^{-1}(b+a z) \log\left(-\frac{a z}{b+a z}\right) - \frac{1}{8} i \left(i \left(\pi - 2 i \operatorname{csch}^{-1}(b+a z)\right)^2 + 4 \log\left(-\frac{a z}{b+a z}\right) \left(\pi - 2 i \operatorname{csch}^{-1}(b+a z)\right) + 32 \sin^{-1}\left(\frac{1}{\sqrt{2}} \sqrt{1-\frac{i}{b}}\right) \tanh^{-1}\left(\frac{b+i}{\sqrt{b^2+1}} \tan\left(\frac{1}{4}\left(\pi - 2 i \operatorname{csch}^{-1}(b+a z)\right)\right)\right) - 4\left(-2 i \operatorname{csch}^{-1}(b+a z) + 4 \sin^{-1}\left(\frac{1}{\sqrt{2}} \sqrt{1-\frac{i}{b}}\right) + \pi\right) \log\left(\frac{b + \left(\sqrt{b^2+1}+1\right) e^{\operatorname{csch}^{-1}(b+a z)}}{b}\right) - 4\left(-2 i \operatorname{csch}^{-1}(b+a z) - 4 \sin^{-1}\left(\frac{1}{\sqrt{2}} \sqrt{1-\frac{i}{b}}\right) + \pi\right) \log\left(\frac{b - \left(\sqrt{b^2+1}-1\right) e^{\operatorname{csch}^{-1}(b+a z)}}{b}\right) + 8 i \left(\operatorname{Li}_2\left(\frac{\left(\sqrt{b^2+1}-1\right) e^{\operatorname{csch}^{-1}(b+a z)}}{b}\right) + \operatorname{Li}_2\left(-\frac{\left(\sqrt{b^2+1}+1\right) e^{\operatorname{csch}^{-1}(b+a z)}}{b}\right)\right)\right) + \frac{1}{2}\left(\operatorname{Li}_2\left(e^{-2 \operatorname{csch}^{-1}(b+a z)}\right) - \operatorname{csch}^{-1}(b+a z)\left(\operatorname{csch}^{-1}(b+a z) + 2 \log\left(1 - e^{-2 \operatorname{csch}^{-1}(b+a z)}\right)\right)\right)$$

01.29.21.0010.01

$$\int \frac{\operatorname{csch}^{-1}(a z)}{z}\, dz = \frac{1}{2}\left(\operatorname{Li}_2\left(e^{-2 \operatorname{csch}^{-1}(a z)}\right) - \operatorname{csch}^{-1}(a z)\left(\operatorname{csch}^{-1}(a z) + 2 \log\left(1 - e^{-2 \operatorname{csch}^{-1}(a z)}\right)\right)\right)$$

01.29.21.0011.01

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

Power arguments

01.29.21.0012.01

$$\int \operatorname{csch}^{-1}(a z^r)\, dz = z\left(\operatorname{csch}^{-1}(a z^r) + \frac{a r z^r}{\sqrt{a^2 z^{2r}+1}} \sqrt{\frac{z^{-2r}}{a^2}+1}\; {}_2F_1\left(\frac{1}{2r}, \frac{1}{2}; 1+\frac{1}{2r}; -a^2 z^{2r}\right)\right)$$

01.29.21.0013.01

$$\int z^{\alpha-1} \operatorname{csch}^{-1}(a z^r)\, dz = \frac{z^\alpha}{\alpha^2}\left(\alpha \operatorname{csch}^{-1}(a z^r) + \frac{a r z^r}{\sqrt{a^2 z^{2r}+1}} \sqrt{\frac{z^{-2r}}{a^2}+1}\; {}_2F_1\left(\frac{\alpha}{2r}, \frac{1}{2}; \frac{\alpha}{2r}+1; -a^2 z^{2r}\right)\right)$$

01.29.21.0014.01

$$\int \frac{\operatorname{csch}^{-1}(a z^r)}{z}\, dz = \left(\operatorname{csch}^{-1}(a z^r) - \sinh^{-1}\left(\frac{z^{-r}}{a}\right)\right)\log(z) - \frac{z^{-r}}{a r}\, {}_3F_2\left(\frac{1}{2}, \frac{1}{2}, \frac{1}{2}; \frac{3}{2}, \frac{3}{2}; -\frac{z^{-2r}}{a^2}\right)$$

Arguments involving polynomials

01.29.21.0015.01

$$\int \operatorname{csch}^{-1}\left(a z^2 + b z + c\right) dz = z \operatorname{csch}^{-1}(c + z(b + a z)) -$$

$$\left(2\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)\sqrt{\left(\left(\sqrt{b^2 - 4a(c + i)}\left(-b - 2az + \sqrt{b^2 - 4ac + 4ai}\right)\right)\right/}\right.$$

$$\left.\left(\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)\left(-b - 2az + \sqrt{b^2 - 4a(c + i)}\right)\right)\right)$$

$$\sqrt{\left(-\left(\sqrt{b^2 - 4a(c + i)}\left(b + 2az + \sqrt{b^2 - 4ac + 4ai}\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{b^2 - 4a(c - i)} - \sqrt{b^2 - 4a(c + i)}\right)\left(b + 2az - \sqrt{b^2 - 4a(c + i)}\right)\right)\right)$$

$$\left(b + 2az - \sqrt{b^2 - 4a(c + i)}\right)^2 \sqrt{\left(\left(\left(\sqrt{b^2 - 4a(c - i)} - \sqrt{b^2 - 4a(c + i)}\right)\left(b + 2az + \sqrt{b^2 - 4a(c + i)}\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)\left(b + 2az - \sqrt{b^2 - 4a(c + i)}\right)\right)\right)$$

$$\left(\sqrt{b^2 - 4ac}\left(b\left(b - \sqrt{b^2 - 4a(c + i)}\right) - 4a(c + i)\right)\right.$$

$$F\left(\sin^{-1}\left(\sqrt{\left(\left(\left(\sqrt{b^2 - 4a(c - i)} - \sqrt{b^2 - 4a(c + i)}\right)\left(b + 2az + \sqrt{b^2 - 4a(c + i)}\right)\right)\right/}\right.\right.$$

$$\left.\left.\left(\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)\left(b + 2az - \sqrt{b^2 - 4a(c + i)}\right)\right)\right)\right) \right|$$

$$\left.\frac{\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)^2}{\left(\sqrt{b^2 - 4a(c - i)} - \sqrt{b^2 - 4a(c + i)}\right)^2}\right) + \sqrt{b^2 - 4a(c + i)}\left(\left(b^2 + \sqrt{b^2 - 4ac}\, b - 4ac\right)\right.$$

$$\Pi\left(-\left(\left(\sqrt{b^2 - 4ac} + \sqrt{b^2 - 4a(c + i)}\right)\left(\sqrt{b^2 - 4a(c - i)} + \sqrt{b^2 - 4a(c + i)}\right)\right)\right/$$

$$\left(\left(\sqrt{b^2-4\,a\,c}-\sqrt{b^2-4\,a\,(c+i)}\right)\left(\sqrt{b^2-4\,a\,(c+i)}-\sqrt{b^2-4\,a\,(c-i)}\right)\right);$$

$$\sin^{-1}\left(\sqrt{\left(\left(\left(\sqrt{b^2-4\,a\,(c-i)}-\sqrt{b^2-4\,a\,(c+i)}\right)\left(b+2\,a\,z+\sqrt{b^2-4\,a\,(c+i)}\right)\right)\Big/\left(\left(\sqrt{b^2-4\,a\,(c-i)}+\sqrt{b^2-4\,a\,(c+i)}\right)\left(b+2\,a\,z-\sqrt{b^2-4\,a\,(c+i)}\right)\right)\right)}\right) \Bigg|$$

$$\left.\frac{\left(\sqrt{b^2-4\,a\,(c-i)}+\sqrt{b^2-4\,a\,(c+i)}\right)^2}{\left(\sqrt{b^2-4\,a\,(c-i)}-\sqrt{b^2-4\,a\,(c+i)}\right)^2}\right)+\left(-b^2+\sqrt{b^2-4\,a\,c}\;b+4\,a\,c\right)$$

$$\Pi\left(-\left(\left(\sqrt{b^2-4\,a\,c}-\sqrt{b^2-4\,a\,(c+i)}\right)\left(\sqrt{b^2-4\,a\,(c-i)}+\sqrt{b^2-4\,a\,(c+i)}\right)\right)\Big/\right.$$

$$\left(\left(\sqrt{b^2-4\,a\,c}+\sqrt{b^2-4\,a\,(c+i)}\right)\left(\sqrt{b^2-4\,a\,(c+i)}-\sqrt{b^2-4\,a\,(c-i)}\right)\right);$$

$$\sin^{-1}\left(\sqrt{\left(\left(\left(\sqrt{b^2-4\,a\,(c-i)}-\sqrt{b^2-4\,a\,(c+i)}\right)\left(b+2\,a\,z+\sqrt{b^2-4\,a\,(c+i)}\right)\right)\Big/\left(\left(\sqrt{b^2-4\,a\,(c-i)}+\sqrt{b^2-4\,a\,(c+i)}\right)\left(b+2\,a\,z-\sqrt{b^2-4\,a\,(c+i)}\right)\right)\right)}\right) \Bigg|$$

$$\left.\left.\frac{\left(\sqrt{b^2-4\,a\,(c-i)}+\sqrt{b^2-4\,a\,(c+i)}\right)^2}{\left(\sqrt{b^2-4\,a\,(c-i)}-\sqrt{b^2-4\,a\,(c+i)}\right)^2}\right)\right)\right)\right)\Big/\left(a\sqrt{b^2-4\,a\,c}\right.$$

$$\sqrt{b^2-4\,a\,(c+i)}\left(\sqrt{b^2-4\,a\,c}-\sqrt{b^2-4\,a\,(c+i)}\right)\left(\sqrt{b^2-4\,a\,c}+\sqrt{b^2-4\,a\,(c+i)}\right)$$

$$\left(\sqrt{b^2-4\,a\,(c+i)}-\sqrt{b^2-4\,a\,(c-i)}\right)$$

$$(c+z\,(b+a\,z))$$

$$\left.\sqrt{\frac{(c+z\,(b+a\,z))^2+1}{(c+z\,(b+a\,z))^2}}\right)$$

Arguments involving exponential functions

01.29.21.0016.01

$$\int \operatorname{csch}^{-1}(a^z)\,dz = \frac{1}{8\sqrt{a^{2z}+1}\,\log(a)}\left(\sqrt{a^{-2z}+1}\left(\log^2(-a^{2z}) - 4\log\left(\frac{1}{2}\left(\sqrt{a^{2z}+1}+1\right)\right)\log(-a^{2z}) + 2\log^2\left(\frac{1}{2}\left(\sqrt{a^{2z}+1}+1\right)\right) + \tanh^{-1}\left(\sqrt{a^{2z}+1}\right)\left(4\log(-a^{2z}) - 8z\log(a)\right) - 4\operatorname{Li}_2\left(\frac{1}{2}-\frac{1}{2}\sqrt{a^{2z}+1}\right)\right)a^z\right) + z\operatorname{csch}^{-1}(a^z)$$

Arguments involving trigonometric functions

Involving tan

01.29.21.0017.01

$$\int \operatorname{csch}^{-1}(\tan(z))\,dz = \frac{1}{2}\left(2\,i\log\left(1-i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right)\operatorname{csch}^{-1}(\tan(z)) - 2\,i\log\left(1+i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right)\operatorname{csch}^{-1}(\tan(z)) + \pi\operatorname{csch}^{-1}(\tan(z)) + \pi\log\left(1-i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right) + \pi\log\left(1+i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right) - \pi\log\left(-\sin\left(\frac{1}{4}\left(\pi-2\,i\operatorname{csch}^{-1}(\tan(z))\right)\right)\right) - \pi\log\left(\sin\left(\frac{1}{4}\left(2\,i\operatorname{csch}^{-1}(\tan(z))+\pi\right)\right)\right) + 2\,i\operatorname{Li}_2\left(-i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right) - 2\,i\operatorname{Li}_2\left(i\,e^{-\operatorname{csch}^{-1}(\tan(z))}\right)\right)$$

Involving cot

01.29.21.0018.01

$$\int \operatorname{csch}^{-1}(\cot(z))\,dz = \frac{1}{2}\left(-2\,i\log\left(1-i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right)\operatorname{csch}^{-1}(\cot(z)) + 2\,i\log\left(1+i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right)\operatorname{csch}^{-1}(\cot(z)) - \pi\operatorname{csch}^{-1}(\cot(z)) - \pi\log\left(1-i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right) - \pi\log\left(1+i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right) + \pi\log\left(-\sin\left(\frac{1}{4}\left(\pi-2\,i\operatorname{csch}^{-1}(\cot(z))\right)\right)\right) + \pi\log\left(\sin\left(\frac{1}{4}\left(2\,i\operatorname{csch}^{-1}(\cot(z))+\pi\right)\right)\right) - 2\,i\operatorname{Li}_2\left(-i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right) + 2\,i\operatorname{Li}_2\left(i\,e^{-\operatorname{csch}^{-1}(\cot(z))}\right)\right)$$

Involving csc

01.29.21.0019.01

$$\int \operatorname{csch}^{-1}(\csc(z))\,dz = z\operatorname{csch}^{-1}(\csc(z)) + \frac{1}{4}\Bigg(z\Bigg(\log\Big(1 - e^{-iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big) - \log\Big(1 - e^{iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big) - \log\Big(i\,e^{-iz}\Big(i\cos(z) + \sqrt{\sin^2(z)+1}\Big)+1\Big) + \log\Big(i\,e^{iz}\Big(i\cos(z) + \sqrt{\sin^2(z)+1}\Big)+1\Big)\Bigg) + \tan^{-1}\left(\frac{\cos(z)}{\sqrt{\sin^2(z)+1}}\right)\Bigg(\log\Big(1 - e^{-iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big) + \log\Big(1 - e^{iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big) + \log\Big(i\,e^{-iz}\Big(i\cos(z) + \sqrt{\sin^2(z)+1}\Big)+1\Big) + \log\Big(i\,e^{iz}\Big(i\cos(z) + \sqrt{\sin^2(z)+1}\Big)+1\Big)\Bigg) + i\Bigg(-\operatorname{Li}_2\Big(e^{-iz}\Big(\cos(z) - i\sqrt{\sin^2(z)+1}\Big)\Big) - \operatorname{Li}_2\Big(e^{iz}\Big(\cos(z) - i\sqrt{\sin^2(z)+1}\Big)\Big) + \operatorname{Li}_2\Big(e^{-iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big) + \operatorname{Li}_2\Big(e^{iz}\Big(\cos(z) + i\sqrt{\sin^2(z)+1}\Big)\Big)\Bigg)\Bigg)$$

Involving sec

01.29.21.0020.01

$$\int \operatorname{csch}^{-1}(\sec(z))\,dz = \frac{1}{4}\Bigg(4z\operatorname{csch}^{-1}(\sec(z)) - 2\pi\tanh^{-1}\left(\frac{\sqrt{2}\cos(z)}{\sqrt{\cos(2z)+3}}\right) + \frac{1}{2}(\pi - 2z)\Bigg(-\log\Big(\frac{1}{2}\Big(-2e^{iz}\sqrt{\cos^2(z)+1} + e^{2iz}+1\Big)\Big) + \log\Big(\frac{1}{2}\Big(2e^{iz}\sqrt{\cos^2(z)+1} + e^{2iz}+1\Big)\Big) - \log\Big(e^{-iz}\Big(-i\sin(z) + e^{iz} - \sqrt{\cos^2(z)+1}\Big)\Big) + \log\Big(e^{-iz}\Big(-i\sin(z) + e^{iz} + \sqrt{\cos^2(z)+1}\Big)\Big)\Bigg) - \tan^{-1}\left(\frac{\sin(z)}{\sqrt{\cos^2(z)+1}}\right)\Bigg(\log\Big(\frac{1}{2}\Big(-2e^{iz}\sqrt{\cos^2(z)+1} + e^{2iz}+1\Big)\Big) + \log\Big(\frac{1}{2}\Big(2e^{iz}\sqrt{\cos^2(z)+1} + e^{2iz}+1\Big)\Big) + \log\Big(e^{-iz}\Big(-i\sin(z) + e^{iz} - \sqrt{\cos^2(z)+1}\Big)\Big) + \log\Big(e^{-iz}\Big(-i\sin(z) + e^{iz} + \sqrt{\cos^2(z)+1}\Big)\Big)\Bigg) + i\Bigg(-\operatorname{Li}_2\Big(-e^{-iz}\Big(\sqrt{\cos^2(z)+1} - i\sin(z)\Big)\Big) - \operatorname{Li}_2\Big(e^{iz}\Big(\sqrt{\cos^2(z)+1} - i\sin(z)\Big)\Big) + \operatorname{Li}_2\Big(e^{-iz}\Big(i\sin(z) + \sqrt{\cos^2(z)+1}\Big)\Big) + \operatorname{Li}_2\Big(-e^{iz}\Big(i\sin(z) + \sqrt{\cos^2(z)+1}\Big)\Big)\Bigg)\Bigg)$$

Arguments involving hyperbolic functions

Involving sinh

01.29.21.0021.01

$$\int \operatorname{csch}^{-1}(\sinh(z))\,dz = z\operatorname{csch}^{-1}(\sinh(z)) + \sqrt{\coth^2(z)}\,\left(z\left(\log(1-e^{-z}) - \log(1+e^{-z})\right) + \operatorname{Li}_2(-e^{-z}) - \operatorname{Li}_2(e^{-z})\right)\tanh(z)$$

Involving tanh

01.29.21.0022.01

$$\int \operatorname{csch}^{-1}(\tanh(z))\,dz = -\frac{1}{4}\,i\left(-8\,i\sin^{-1}\left(\sqrt{\frac{1}{2}+\frac{i}{2}}\right)\tan^{-1}\left(\frac{(1+i)\tan\left(\frac{1}{4}\left(\pi - 2\,i\operatorname{csch}^{-1}(\tanh(z))\right)\right)}{\sqrt{2}}\right) - \right.$$

$$8\sin^{-1}\left(\sqrt{\frac{1}{2}-\frac{i}{2}}\right)\tanh^{-1}\left(\frac{(1+i)\tan\left(\frac{1}{4}\left(\pi - 2\,i\operatorname{csch}^{-1}(\tanh(z))\right)\right)}{\sqrt{2}}\right) -$$

$$2\,i\operatorname{csch}^{-1}(\tanh(z))\log\left(1-\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) - 4\sin^{-1}\left(\sqrt{\frac{1}{2}-\frac{i}{2}}\right)\log\left(1-\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) +$$

$$\pi\log\left(1-\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) + 2\,i\operatorname{csch}^{-1}(\tanh(z))\log\left(1+\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) -$$

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

$$2\,i\operatorname{csch}^{-1}(\tanh(z))\log\left(1-\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) + 4\sin^{-1}\left(\sqrt{\frac{1}{2}+\frac{i}{2}}\right)\log\left(1-\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) -$$

$$\pi\log\left(1-\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) - 2\,i\operatorname{csch}^{-1}(\tanh(z))\log\left(1+\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) +$$

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

$$\pi\log(\coth(z)-1) + \pi\log(\coth(z)+1) + 2\,i\operatorname{Li}_2\left(-\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) -$$

$$\left. 2\,i\operatorname{Li}_2\left(\left(-1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) - 2\,i\operatorname{Li}_2\left(-\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right) + 2\,i\operatorname{Li}_2\left(\left(1+\sqrt{2}\right)e^{\operatorname{csch}^{-1}(\tanh(z))}\right)\right)$$

Involving coth

01.29.21.0023.01

$$\int \operatorname{csch}^{-1}(\coth(z))\, dz = -\frac{1}{4}\, i \left(-8\, i \sin^{-1}\left(\sqrt{\frac{1}{2}+\frac{i}{2}}\right) \tan^{-1}\left(\frac{(1+i)\tan\left(\frac{1}{4}\left(\pi - 2\, i \operatorname{csch}^{-1}(\coth(z))\right)\right)}{\sqrt{2}}\right) - \right.$$
$$8 \sin^{-1}\left(\sqrt{\frac{1}{2}-\frac{i}{2}}\right) \tanh^{-1}\left(\frac{(1+i)\tan\left(\frac{1}{4}\left(\pi - 2\, i \operatorname{csch}^{-1}(\coth(z))\right)\right)}{\sqrt{2}}\right) -$$
$$2\, i \operatorname{csch}^{-1}(\coth(z)) \log\left(1 - \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) - 4 \sin^{-1}\left(\sqrt{\frac{1}{2}-\frac{i}{2}}\right) \log\left(1 - \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) +$$
$$\pi \log\left(1 - \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) + 2\, i \operatorname{csch}^{-1}(\coth(z)) \log\left(1 + \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) -$$
$$4 \sin^{-1}\left(\sqrt{\frac{1}{2}+\frac{i}{2}}\right) \log\left(1 + \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) - \pi \log\left(1 + \left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) +$$
$$2\, i \operatorname{csch}^{-1}(\coth(z)) \log\left(1 - \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) + 4 \sin^{-1}\left(\sqrt{\frac{1}{2}+\frac{i}{2}}\right) \log\left(1 - \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) -$$
$$\pi \log\left(1 - \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) - 2\, i \operatorname{csch}^{-1}(\coth(z)) \log\left(1 + \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) +$$
$$4 \sin^{-1}\left(\sqrt{\frac{1}{2}-\frac{i}{2}}\right) \log\left(1 + \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) + \pi \log\left(1 + \left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) -$$
$$\pi \log(\tanh(z) - 1) + \pi \log(\tanh(z) + 1) + 2\, i \operatorname{Li}_2\left(-\left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) -$$
$$\left. 2\, i \operatorname{Li}_2\left(\left(-1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) - 2\, i \operatorname{Li}_2\left(-\left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right) + 2\, i \operatorname{Li}_2\left(\left(1+\sqrt{2}\right) e^{\operatorname{csch}^{-1}(\coth(z))}\right)\right)$$

Involving csch

01.29.21.0024.01

$$\int \operatorname{csch}^{-1}(\operatorname{csch}(z))\, dz = z \operatorname{csch}^{-1}(\operatorname{csch}(z)) - \frac{1}{2} z^2 \sqrt{\cosh^2(z)}\, \operatorname{sech}(z)$$

Involving sech

01.29.21.0025.01

$$\int \operatorname{csch}^{-1}(\operatorname{sech}(z))\, dz = \frac{1}{8}\Bigg(8 z \operatorname{csch}^{-1}(\operatorname{sech}(z)) + 4 i \pi \tanh^{-1}\left(\frac{\sqrt{2}\cosh(z)}{\sqrt{\cosh(2z)+3}}\right) + 2 z \log\left(e^{-z}\left(-\sinh(z) + e^z - \sqrt{\cosh^2(z)+1}\right)\right) -$$

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

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

$$i\pi\log\left(e^{-z}\left(-\sinh(z)+e^z+\sqrt{\cosh^2(z)+1}\right)\right) + 2 z\log\left(e^z\sinh(z) - e^z\sqrt{\cosh^2(z)+1}+1\right) -$$

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

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

$$i\pi\log\left(e^z\sinh(z)+e^z\sqrt{\cosh^2(z)+1}+1\right) + 2\operatorname{Li}_2\left(e^z\left(\sqrt{\cosh^2(z)+1}-\sinh(z)\right)\right) +$$

$$2\operatorname{Li}_2\left(e^{-z}\left(\sinh(z)-\sqrt{\cosh^2(z)+1}\right)\right) - 2\operatorname{Li}_2\left(e^{-z}\left(\sinh(z)+\sqrt{\cosh^2(z)+1}\right)\right) - 2\operatorname{Li}_2\left(-e^z\left(\sinh(z)+\sqrt{\cosh^2(z)+1}\right)\right)\Bigg)$$

Involving logarithm

Involving log

01.29.21.0026.01

$$\int \log(b z)\operatorname{csch}^{-1}(a z)\, dz = z\operatorname{csch}^{-1}(a z)(\log(b z)-1) +$$

$$\left(\sqrt{a^2 z^2+1}\left(-2 b\sqrt{\frac{a^2}{b^2}}\sinh^{-1}(a z) - a\left(\sinh^{-1}\left(\sqrt{\frac{a^2}{b^2}}\, b z\right)^2 + 2\log\left(1-e^{-2\sinh^{-1}\left(\sqrt{\frac{a^2}{b^2}}\, b z\right)}\right)\sinh^{-1}\left(\sqrt{\frac{a^2}{b^2}}\, b z\right) -\right.\right.\right.$$

$$\left.\left.\left. 2\log(b z)\log\left(b\sqrt{\frac{a^2}{b^2}}\, z + \sqrt{a^2 z^2+1}\right)\right) + a\operatorname{Li}_2\left(e^{-2\sinh^{-1}\left(\sqrt{\frac{a^2}{b^2}}\, b z\right)}\right)\right)\right) \Big/ \left(2\left(\frac{a^2}{b^2}\right)^{3/2} b^3\sqrt{1+\frac{1}{a^2 z^2}}\, z\right)$$

Involving logarithm and a power function

Involving log and power

01.29.21.0027.01

$$\int z^{\alpha-1}\log(b\,z)\,\mathrm{csch}^{-1}(a\,z)\,dz = \frac{z^\alpha}{\alpha^3}\left(\alpha\,\mathrm{csch}^{-1}(a\,z)\,(\alpha\log(b\,z)-1) - \frac{1}{a\sqrt{1+\frac{1}{a^2 z^2}}\;z}\left(\sqrt{a^2 z^2+1}\left({}_3F_2\left(\frac{1}{2},\frac{\alpha}{2},\frac{\alpha}{2};\frac{\alpha}{2}+1,\frac{\alpha}{2}+1;-a^2 z^2\right)-\alpha\,{}_2F_1\left(\frac{1}{2},\frac{\alpha}{2};\frac{\alpha}{2}+1;-a^2 z^2\right)\log(z)+{}_2F_1\left(\frac{\alpha}{2},\frac{1}{2};\frac{\alpha}{2}+1;-a^2 z^2\right)(\alpha\log(z)-\alpha\log(b\,z)+1)\right)\right)\right)$$

Involving functions of the direct function

Involving elementary functions of the direct function

Involving powers of the direct function

01.29.21.0028.01

$$\int \mathrm{csch}^{-1}(a\,z)^2\,dz = \frac{1}{a}\left(\mathrm{csch}^{-1}(a\,z)\left(a\,z\,\mathrm{csch}^{-1}(a\,z)-2\log\left(1-e^{-\mathrm{csch}^{-1}(a\,z)}\right)+2\log\left(1+e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)-2\,\mathrm{Li}_2\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)+2\,\mathrm{Li}_2\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

01.29.21.0029.01

$$\int \mathrm{csch}^{-1}(a\,z)^3\,dz = \frac{1}{a}\left(a\,z\,\mathrm{csch}^{-1}(a\,z)^3-3\log\left(1-e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^2+3\log\left(1+e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^2-6\,\mathrm{Li}_2\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)+6\,\mathrm{Li}_2\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)-6\,\mathrm{Li}_3\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)+6\,\mathrm{Li}_3\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

01.29.21.0030.01

$$\int \mathrm{csch}^{-1}(a\,z)^4\,dz = -\frac{1}{2\,a}\left(-2\,a\,z\,\mathrm{csch}^{-1}(a\,z)^4-2\,\mathrm{csch}^{-1}(a\,z)^4-8\log\left(1+e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^3+8\log\left(1-e^{\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^3+24\,\mathrm{Li}_2\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^2+24\,\mathrm{Li}_2\left(e^{\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)^2+48\,\mathrm{Li}_3\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)-48\,\mathrm{Li}_3\left(e^{\mathrm{csch}^{-1}(a\,z)}\right)\mathrm{csch}^{-1}(a\,z)+\pi^4+48\,\mathrm{Li}_4\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)+48\,\mathrm{Li}_4\left(e^{\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

Involving functions of the direct function and elementary functions

Involving elementary functions of the direct function and elementary functions

Involving powers of the direct function and a power function

01.29.21.0031.01

$$\int z^{\alpha-1}\,\mathrm{csch}^{-1}(a\,z)^2\,dz = \frac{1}{2\,a^2\,(\alpha-1)\,\alpha}\,z^{\alpha-2}\left(2\,a\,z\,\mathrm{csch}^{-1}(a\,z)\left(a\,z\,(\alpha-1)\,\mathrm{csch}^{-1}(a\,z)+2\,\sqrt{1+\frac{1}{a^2\,z^2}}\;{}_2F_1\!\left(1,1-\frac{\alpha}{2};\frac{3-\alpha}{2};-\frac{1}{a^2\,z^2}\right)\right)+ 2^{\alpha}\,\sqrt{\pi}\,(\alpha-1)\,\Gamma(1-\alpha)\,{}_3\tilde{F}_2\!\left(1,1-\frac{\alpha}{2},1-\frac{\alpha}{2};\frac{3-\alpha}{2},2-\frac{\alpha}{2};-\frac{1}{a^2\,z^2}\right)\right)$$

01.29.21.0032.01

$$\int z\,\mathrm{csch}^{-1}(a\,z)^2\,dz = \frac{1}{2}\,z^2\,\mathrm{csch}^{-1}(a\,z)^2+\frac{z}{a}\,\sqrt{\frac{a^2\,z^2+1}{a^2\,z^2}}\,\mathrm{csch}^{-1}(a\,z)+\frac{\log(z)}{a^2}$$

01.29.21.0033.01

$$\int z^2\,\mathrm{csch}^{-1}(a\,z)^2\,dz = \frac{1}{3\,a^3}\left(a^3\,\mathrm{csch}^{-1}(a\,z)^2\,z^3+a^2\,\sqrt{1+\frac{1}{a^2\,z^2}}\,\mathrm{csch}^{-1}(a\,z)\,z^2+a\,z+ \mathrm{csch}^{-1}(a\,z)\log\!\left(1-e^{-\mathrm{csch}^{-1}(a\,z)}\right)-\mathrm{csch}^{-1}(a\,z)\log\!\left(1+e^{-\mathrm{csch}^{-1}(a\,z)}\right)+\mathrm{Li}_2\!\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)-\mathrm{Li}_2\!\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

01.29.21.0034.01

$$\int z\,\mathrm{csch}^{-1}(a\,z)^3\,dz = \frac{1}{2\,a^2}\left(\mathrm{csch}^{-1}(a\,z)\left(a^2\,z^2\,\mathrm{csch}^{-1}(a\,z)^2+3\left(a\,\sqrt{1+\frac{1}{a^2\,z^2}}\,z-1\right)\mathrm{csch}^{-1}(a\,z)-6\log\!\left(1-e^{-2\,\mathrm{csch}^{-1}(a\,z)}\right)\right)+3\,\mathrm{Li}_2\!\left(e^{-2\,\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

01.29.21.0035.01

$$\int z^2\,\mathrm{csch}^{-1}(a\,z)^3\,dz = \frac{1}{a^3}\left(\frac{1}{3}\,a^3\,z^3\,\mathrm{csch}^{-1}(a\,z)^3+\frac{1}{2}\left(\log\!\left(1-e^{-\mathrm{csch}^{-1}(a\,z)}\right)-\log\!\left(1+e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)\mathrm{csch}^{-1}(a\,z)^2+\frac{1}{2}\,a^2\,z^2\,\sqrt{1+\frac{1}{a^2\,z^2}}\,\mathrm{csch}^{-1}(a\,z)^2+ a\,z\,\mathrm{csch}^{-1}(a\,z)+\left(\mathrm{Li}_2\!\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)-\mathrm{Li}_2\!\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)\mathrm{csch}^{-1}(a\,z)-\log\!\left(\tanh\!\left(\frac{1}{2}\,\mathrm{csch}^{-1}(a\,z)\right)\right)+ \mathrm{Li}_3\!\left(-e^{-\mathrm{csch}^{-1}(a\,z)}\right)-\mathrm{Li}_3\!\left(e^{-\mathrm{csch}^{-1}(a\,z)}\right)\right)$$

Definite integration

For the direct function itself

01.29.21.0036.01

$$\int_1^\infty \frac{\operatorname{csch}^{-1}(t)}{t}\,dt = \frac{1}{12}\left(6\log^2\left(1+\sqrt{2}\right)+12\log\left(\frac{2}{1+\sqrt{2}}\right)\log\left(1+\sqrt{2}\right)+\pi^2-6\,\mathrm{Li}_2\left(\frac{1}{\left(1+\sqrt{2}\right)^2}\right)\right)$$

Representations through more general functions

Through hypergeometric functions

Involving $_2F_1$

01.29.26.0001.01

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

Involving $_pF_q$

01.29.26.0002.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\,z\left(\log\left(\frac{4}{z^2}\right)+\frac{z^2}{2}\,{}_3F_2\left(\frac{3}{2},1,1;2,2;-z^2\right)\right) /; i\,z \notin (-\infty,-1) \bigwedge i\,z \notin (1,\infty)$$

01.29.26.0003.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{z^2}\,{}_3F_2\left(1,1,1;\frac{3}{2},2;-\frac{1}{z^2}\right)$$

Through hypergeometric functions of two variables

01.29.26.0004.01

$$\operatorname{csch}^{-1}(z) = -\frac{i\,\pi}{2}+i\sqrt{2}\,\sqrt{-i\,(z-i)}\;F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2};\frac{1}{2};\frac{1}{2};\\ ;\frac{3}{2};\frac{3}{2};\end{matrix}\;-1,1+i\,z\right)$$

01.29.26.0005.01

$$\operatorname{csch}^{-1}(z) = \frac{i\,\pi}{2}-i\sqrt{2}\,\sqrt{i\,(z+i)}\;F_{0\times1\times1}^{1\times1\times1}\left(\begin{matrix}\frac{3}{2};\frac{1}{2};\frac{1}{2};\\ ;\frac{3}{2};\frac{3}{2};\end{matrix}\;-1,1-i\,z\right)$$

Through Meijer *G*

Classical cases for the direct function itself

01.29.26.0006.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z^2}}{2\sqrt{\pi}\,z}\,G_{2,2}^{2,1}\left(z^2\,\middle|\,\begin{matrix}\frac{1}{2},1\\ 0,0\end{matrix}\right)$$

01.29.26.0007.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2\sqrt{\pi}}\,G_{2,2}^{2,1}\left(z^2\,\middle|\,\begin{matrix}\frac{1}{2},1\\ 0,0\end{matrix}\right) /; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.26.0008.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2\sqrt{\pi}\, z} G_{2,2}^{1,2}\left(\frac{1}{z^2} \,\middle|\, \begin{array}{c} \frac{1}{2}, \frac{1}{2} \\ 0, -\frac{1}{2} \end{array}\right)$$

01.29.26.0009.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{1}{2\sqrt{\pi}} G_{2,2}^{2,1}\left(z \,\middle|\, \begin{array}{c} \frac{1}{2}, 1 \\ 0, 0 \end{array}\right)$$

01.29.26.0029.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) - \frac{1}{2}\sqrt{z}\sqrt{\frac{1}{z}}\log\left(\frac{4}{z}\right) + \frac{1}{2}\sqrt{z}\sqrt{\frac{1}{z}}\sum_{k=1}^{n}\frac{(-1)^k\left(\frac{1}{2}\right)_k z^k}{k\,k!} = \frac{(-1)^n\sqrt{z}}{2\sqrt{\pi}}\sqrt{\frac{1}{z}}\, G_{3,3}^{1,3}\left(z \,\middle|\, \begin{array}{c} \frac{1}{2}, 1, n+1 \\ n+1, 0, 0 \end{array}\right) /;\, n \in \mathbb{N} \land z \notin (1, \infty)$$

01.29.26.0030.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) - \sum_{k=0}^{n}\frac{(-1)^k\left(\frac{1}{2}\right)_k z^{-k-\frac{1}{2}}}{k!\,(2k+1)} = \frac{(-1)^{n-1}\sqrt{z}}{2\sqrt{\pi}}\sqrt{\frac{1}{z}}\, G_{3,3}^{1,3}\left(\frac{1}{z} \,\middle|\, \begin{array}{c} 1, 1, n+\frac{3}{2} \\ n+\frac{3}{2}, 0, \frac{1}{2} \end{array}\right) /;\, n \in \mathbb{N}$$

Classical cases involving algebraic functions

01.29.26.0010.01

$$\frac{\operatorname{csch}^{-1}\left(\sqrt{z}\right)}{\sqrt{1+\frac{1}{z}}} = \frac{\sqrt{\pi}}{2} G_{2,2}^{2,1}\left(z \,\middle|\, \begin{array}{c} \frac{1}{2}, 1 \\ \frac{1}{2}, \frac{1}{2} \end{array}\right)$$

01.29.26.0011.01

$$\frac{1}{\sqrt{z+1}}\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\sqrt{\pi}}{2} G_{2,2}^{2,1}\left(z \,\middle|\, \begin{array}{c} 0, \frac{1}{2} \\ 0, 0 \end{array}\right) /;\, z \notin (-1, 0)$$

01.29.26.0012.01

$$\frac{1}{\sqrt{z+1}}\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{\pi}}{2} G_{2,2}^{1,2}\left(z \,\middle|\, \begin{array}{c} \frac{1}{2}, \frac{1}{2} \\ \frac{1}{2}, 0 \end{array}\right)$$

Classical cases for powers of csch^{-1}

01.29.26.0013.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right)^2 = \frac{\sqrt{\pi}}{2} G_{3,3}^{3,1}\left(z \,\middle|\, \begin{array}{c} 0, 1, \frac{1}{2} \\ 0, 0, 0 \end{array}\right)$$

Generalized cases for the direct function itself

01.29.26.0014.01

$$\operatorname{csch}^{-1}(z) = \frac{z}{2\sqrt{\pi}} G_{2,2}^{1,2}\left(\sqrt{\frac{1}{z^2}}, \frac{1}{2} \,\middle|\, \begin{array}{c} \frac{3}{2}, \frac{3}{2} \\ 1, \frac{1}{2} \end{array}\right)$$

01.29.26.0015.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2\sqrt{\pi}} G_{2,2}^{2,1}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} \frac{1}{2}, 1 \\ 0, 0 \end{matrix}\right)$$

Generalized cases involving algebraic functions

01.29.26.0016.01

$$\frac{\operatorname{csch}^{-1}(z)}{\sqrt{z^2+1}} = \frac{1}{2}\sqrt{\pi}\, G_{2,2}^{2,1}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} 0, \frac{1}{2} \\ 0, 0 \end{matrix}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.26.0017.01

$$\frac{1}{\sqrt{1+\frac{1}{z^2}}} \operatorname{csch}^{-1}(z) = \frac{\sqrt{\pi}}{2} G_{2,2}^{2,1}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} \frac{1}{2}, 1 \\ \frac{1}{2}, \frac{1}{2} \end{matrix}\right)$$

01.29.26.0018.01

$$\frac{1}{\sqrt{z^2+1}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right) = \frac{\sqrt{\pi}}{2} G_{2,2}^{1,2}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} \frac{1}{2}, \frac{1}{2} \\ \frac{1}{2}, 0 \end{matrix}\right)$$

Classical cases for powers of csch^{-1}

01.29.26.0019.01

$$\operatorname{csch}^{-1}(z)^2 = \frac{1}{2}\sqrt{\pi}\, G_{3,3}^{3,1}\left(z, \frac{1}{2} \,\middle|\, \begin{matrix} 0, 1, \frac{1}{2} \\ 0, 0, 0 \end{matrix}\right)$$

Through other functions

Involving inverse Jacobi functions

01.29.26.0020.01

$$\operatorname{csch}^{-1}(z) = \operatorname{cs}^{-1}(z \mid 1)$$

01.29.26.0021.01

$$\operatorname{csch}^{-1}(z) = i \operatorname{ds}^{-1}(i z \mid 0)$$

01.29.26.0022.01

$$\operatorname{csch}^{-1}(z) = \operatorname{ds}^{-1}(z \mid 1)$$

01.29.26.0023.01

$$\operatorname{csch}^{-1}(z) = i \operatorname{ns}^{-1}(i z \mid 0)$$

01.29.26.0024.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sc}^{-1}\left(\frac{1}{z} \,\middle|\, 1\right)$$

01.29.26.0025.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sd}^{-1}\left(\frac{1}{z} \,\middle|\, 1\right)$$

01.29.26.0026.01

$$\operatorname{csch}^{-1}(z) = -i \operatorname{sd}^{-1}\left(\frac{i}{z} \,\middle|\, 0\right)$$

01.29.26.0027.01

$$\operatorname{csch}^{-1}(z) = -i\,\operatorname{sn}^{-1}\left(\frac{i}{z} \,\middle|\, 0\right)$$

Involving some hypergeometric-type functions

01.29.26.0028.01

$$\operatorname{csch}^{-1}(z) = -\frac{z}{2}\sqrt{-\frac{1}{z^2}}\; B_{-\frac{1}{z^2}}\left(\frac{1}{2}, \frac{1}{2}\right)$$

Representations through equivalent functions

With inverse function

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

01.29.27.0001.01

$$\operatorname{csch}^{-1}(\operatorname{csch}(z)) = z \;/;\; -\frac{\pi}{2} < \operatorname{Im}(z) < \frac{\pi}{2} \bigvee \left(\operatorname{Im}(z) = -\frac{\pi}{2} \bigwedge \operatorname{Re}(z) \leq 0\right) \bigvee \left(\operatorname{Im}(z) = \frac{\pi}{2} \bigwedge \operatorname{Re}(z) \geq 0\right)$$

01.29.27.0002.01

$$\operatorname{csch}^{-1}(\operatorname{csch}(z)) = -\pi i - z \;/;\; -\frac{3\pi}{2} < \operatorname{Im}(z) < -\frac{\pi}{2} \bigvee \left(\operatorname{Im}(z) = -\frac{3\pi}{2} \bigwedge \operatorname{Re}(z) \leq 0\right) \bigvee \left(\operatorname{Im}(z) = -\frac{\pi}{2} \bigwedge \operatorname{Re}(z) \geq 0\right)$$

01.29.27.0003.01

$$\operatorname{csch}^{-1}(\operatorname{csch}(z)) = \pi i - z \;/;\; \frac{\pi}{2} < \operatorname{Im}(z) < \frac{3\pi}{2} \bigvee \left(\operatorname{Im}(z) = \frac{\pi}{2} \bigwedge \operatorname{Re}(z) \leq 0\right) \bigvee \left(\operatorname{Im}(z) = \frac{3\pi}{2} \bigwedge \operatorname{Re}(z) \geq 0\right)$$

01.29.27.0004.01

$$\operatorname{csch}^{-1}(\operatorname{csch}(z)) = (-1)^k (z - \pi i k) \;/;$$
$$\left(k\pi - \frac{\pi}{2} < \operatorname{Im}(z) < \pi k + \frac{\pi}{2} \bigvee \left(\operatorname{Im}(z) = k\pi - \frac{\pi}{2} \bigwedge \operatorname{Re}(z) \leq 0\right) \bigvee \left(\operatorname{Im}(z) = \pi k + \frac{\pi}{2} \bigwedge \operatorname{Re}(z) \geq 0\right)\right) \bigwedge k \in \mathbb{Z}$$

01.29.27.0005.01

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

01.29.27.2325.01

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

01.29.27.2326.01

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

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

01.29.27.0006.01

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

With related functions

Involving log

01.29.27.0007.01

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

Involving $\sin^{-1}$

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

Involving $\operatorname{csch}^{-1}(z)$ and $\sin^{-1}\left(\frac{i}{z}\right)$

01.29.27.0044.01

$$\operatorname{csch}^{-1}(z) = -i \sin^{-1}\left(\frac{i}{z}\right)$$

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

01.29.27.0045.01

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

01.29.27.0046.01

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

01.29.27.0047.01

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

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

01.29.27.0048.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \sin^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) \geq 0 \lor \operatorname{Im}(z) \geq 0 \lor \operatorname{Im}(z) < -1$$

01.29.27.0049.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \sin^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.0050.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2\,z}}\right)$

01.29.27.0051.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\,i\sin^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2\,z}}\right) /;\ \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 0 \lor \operatorname{Im}(z) \leq -1$$

01.29.27.0052.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} + 2\,i\sin^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2\,z}}\right) /;\ \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.0053.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\sin^{-1}\left(\sqrt{\frac{z+i}{2\,z}}\right)$

01.29.27.0054.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2\,z}}\right)$

01.29.27.0055.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} + 2\,i\sin^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2\,z}}\right) /;\ \operatorname{Re}(z) \leq 0 \lor \operatorname{Im}(z) \leq 0 \lor \operatorname{Im}(z) > 1 \land \operatorname{Re}(z) \geq 0$$

01.29.27.0056.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} - 2\,i\sin^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2\,z}}\right) /;\ 0 < \operatorname{Im}(z) \leq 1 \land \operatorname{Re}(z) > 0$$

01.29.27.0057.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\sin^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\,z}}\right)$

01.29.27.0058.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} + 2\,i\sin^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\,z}}\right) /;\ \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) < 0 \lor \operatorname{Im}(z) \geq 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.0059.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \sin^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2z}}\right) /; 0 \leq \operatorname{Im}(z) < 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.0060.01

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

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

01.29.27.0061.01

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

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

01.29.27.0062.01

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

01.29.27.0063.01

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

01.29.27.0064.01

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

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

01.29.27.0065.01

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

01.29.27.0066.01

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

01.29.27.0067.01

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

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

01.29.27.0068.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i\sin^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /;\ 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0069.01

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

01.29.27.0070.01

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

01.29.27.0071.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + i\sin^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0072.01

$$\operatorname{csch}^{-1}(z) = \frac{z^{3/2}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\sqrt{-\frac{1}{z^2}}\ \sin^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) - \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

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

01.29.27.0073.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i\sin^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /;\ 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0074.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i\sin^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0075.01

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

01.29.27.0076.01

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

01.29.27.0077.01

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

01.29.27.0078.01

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

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

01.29.27.0079.01

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

01.29.27.0080.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \sin^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0081.01

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

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

01.29.27.0082.01

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

01.29.27.0083.01

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

01.29.27.0084.01

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

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

01.29.27.0085.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2}\sin^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2}\right) /; 0 < \arg(z) \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee |z| \ge \sqrt{2} \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.0086.01

$$\operatorname{csch}^{-1}(z) = -\frac{i}{2}\sin^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2}\right) /; -\pi < \arg(z) \le -\frac{1}{4}(3\pi) \bigvee -\frac{\pi}{4} \le \arg(z) \le 0 \bigvee |z| \ge \sqrt{2} \bigwedge -\pi < \arg(z) \le 0$$

01.29.27.0087.01

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

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

Involving $\operatorname{csch}^{-1}(i z)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.29.27.0088.01

$$\operatorname{csch}^{-1}(i z) = -i\sin^{-1}\left(\frac{1}{z}\right)$$

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

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

01.29.27.0089.01

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

01.29.27.0090.01

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

01.29.27.0091.01

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

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

01.29.27.0092.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -i \sin^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.0093.01

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

01.29.27.0094.01

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

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

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

01.29.27.0095.01

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

01.29.27.0096.01

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

01.29.27.0097.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$

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

01.29.27.0098.01

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

01.29.27.0099.01

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

01.29.27.0100.01

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

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

01.29.27.0101.01

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

01.29.27.0102.01

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

01.29.27.0103.01

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

Involving $\operatorname{csch}^{-1}\left(a\left(b z^c\right)^m\right)$

Involving $\operatorname{csch}^{-1}(a(b z^c)^m)$ and $\sin^{-1}\left(\frac{i}{a} b^{-m} z^{-m c}\right)$

01.29.27.0104.01

$$\operatorname{csch}^{-1}(a(b z^c)^m) = -\frac{i(b z^c)^m}{b^m z^{m c}} \sin^{-1}\left(\frac{i b^{-m} z^{-m c}}{a}\right) /; 2m \in \mathbb{Z}$$

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

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

01.29.27.0105.01

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

01.29.27.0106.01

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

01.29.27.0107.01

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

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

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

01.29.27.0108.01

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

01.29.27.0109.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i\sin^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) \le 0$$

01.29.27.0110.01

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

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

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

01.29.27.0111.01

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

01.29.27.0112.01

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

01.29.27.0113.01

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

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

01.29.27.0114.01

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

01.29.27.0115.01

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

01.29.27.0116.01

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

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

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

01.29.27.0117.01

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

01.29.27.0118.01

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

01.29.27.0119.01

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

01.29.27.0120.01

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

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

01.29.27.0121.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{i}{2}\left(\sin^{-1}(z) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) \leq 0$$

01.29.27.0122.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{i}{2}\left(\sin^{-1}(z) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0123.01

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

01.29.27.0124.01

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

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

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

01.29.27.0125.01

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

01.29.27.0126.01

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

01.29.27.0127.01

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

01.29.27.0128.01

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

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

01.29.27.0129.01

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

01.29.27.0130.01

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

01.29.27.0131.01

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

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

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

01.29.27.0132.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -i\left(\sin^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0133.01

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

01.29.27.0134.01

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

01.29.27.0135.01

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

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

01.29.27.0136.01

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

01.29.27.0137.01

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

01.29.27.0138.01

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

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

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

01.29.27.0139.01

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

01.29.27.0140.01

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

01.29.27.0141.01

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

01.29.27.0142.01

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

01.29.27.0143.01

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

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

01.29.27.0144.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\left(\sin^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) /;\ \operatorname{Im}(z) \geq 0$$

01.29.27.0145.01

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

01.29.27.0146.01

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

01.29.27.0147.01

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

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

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

01.29.27.0148.01

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

01.29.27.0149.01

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

01.29.27.0150.01

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

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

01.29.27.0151.01

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

01.29.27.0152.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0153.01

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

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

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

01.29.27.0154.01

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

01.29.27.0155.01

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

01.29.27.0156.01

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

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

01.29.27.0157.01

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

01.29.27.0158.01

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

01.29.27.0159.01

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

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

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

01.29.27.0160.01

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

01.29.27.0161.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right) = -\frac{i}{2}\sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4} /;\ \operatorname{Im}(z) \leq 0$$

01.29.27.0162.01

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

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

01.29.27.0163.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = \frac{1}{2}\,i\,\sin^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4} /;\ \operatorname{Im}(z) \geq 0$$

01.29.27.0164.01

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

01.29.27.0165.01

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

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a z^c-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a z^c-1}}\right)$ and $\sin^{-1}\left(\sqrt{a}\ z^{c/2}\right)$

01.29.27.0166.01

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

01.29.27.0167.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{i\pi}{2} + i\sin^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0168.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{i\pi}{2} - i\sin^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0169.01

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

01.29.27.0008.01

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

01.29.27.0170.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a z^c-1}}\right) = \frac{\sqrt{-a}\ z^{c/2}}{\sqrt{a z^c}}\sin^{-1}\left(\sqrt{a}\ z^{c/2}\right) + \frac{i\pi}{2}$$

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

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

01.29.27.0171.01

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

01.29.27.0172.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\sin^{-1}(z) - \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land i\,z < 0)$$

01.29.27.0173.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{i\,\pi}{2} - i\sin^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.29.27.0174.01

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

01.29.27.0175.01

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

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

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

01.29.27.0176.01

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

01.29.27.0177.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0178.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - i\sin^{-1}\left(\frac{1}{z}\right) /;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0179.01

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

01.29.27.0180.01

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

01.29.27.0181.01

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

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

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

01.29.27.0182.01

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

01.29.27.0183.01

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

01.29.27.0184.01

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

01.29.27.0185.01

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

01.29.27.0186.01

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

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

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

01.29.27.0187.01

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

01.29.27.0188.01

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

01.29.27.0189.01

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

01.29.27.0190.01

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

01.29.27.0191.01

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

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

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

01.29.27.0192.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2} + i \sin^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0193.01

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

01.29.27.0194.01

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

01.29.27.0195.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2} - i \sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.0196.01

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

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

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

01.29.27.0197.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right) = \frac{2z^2}{\sqrt{-z^4}}\sin^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.0198.01

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

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

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

01.29.27.0199.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\sin^{-1}\left(\frac{1}{z}\right) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.0200.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}$$

$$\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}+\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\right.\right.$$

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\middle/\sqrt{\sqrt{1-z^2}-1}\right)$

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

01.29.27.0201.01

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

01.29.27.0202.01

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

01.29.27.0203.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\middle/\left(\sqrt{1-z^2}-1\right)}\right)$

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

01.29.27.0204.01

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

01.29.27.0205.01

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

01.29.27.0206.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

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

01.29.27.0207.01

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

01.29.27.0208.01

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

01.29.27.0209.01

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

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

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

01.29.27.0210.01

$$\text{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\,i\sin^{-1}(z)\;/;\;0<\arg(z)\le\frac{\pi}{2}\bigvee-\pi<\arg(z)\le-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land-1<z<1)$$

01.29.27.0211.01

$$\text{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\,i\sin^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)\bigvee(z\in\mathbb{R}\land z<-1)$$

01.29.27.0212.01

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

Involving $\text{csch}^{-1}\left(\sqrt{2z}\Big/\sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\text{csch}^{-1}\left(\sqrt{2z}\Big/\sqrt{\sqrt{z^2-1}-z}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.29.27.0213.01

$$\text{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}\,i\sin^{-1}\left(\frac{1}{z}\right)\;/;\;0\le\arg(z)\le\frac{\pi}{2}$$

01.29.27.0214.01

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

01.29.27.0215.01

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

01.29.27.0216.01

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

01.29.27.0217.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0218.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\sin^{-1}\left(\frac{1}{z}\right)$

01.29.27.0219.01

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

01.29.27.0220.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{i}{2} \sin^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0221.01

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

01.29.27.0222.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{2} - \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0223.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{2} + \frac{1}{2} i \sin^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0224.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z}\sqrt{z^2}}{z^{3/2}} - \frac{\sqrt{-z^2}}{z} + 2 i \sqrt{z}\sqrt{\frac{1}{z}} - 2 i\right) + \frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{1-z}\sqrt{-\frac{1}{z^2}}\sqrt{\frac{i}{z}}\, z \sqrt{-i z}\, \sin^{-1}\left(\frac{1}{z}\right)$$

Involving $\cos^{-1}$

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\frac{i}{z}\right)$

01.29.27.0225.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(-\frac{i}{z}\right)$

01.29.27.0226.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{\pi}{2} - \cos^{-1}\left(-\frac{i}{z}\right)\right)$$

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

01.29.27.0227.01

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

01.29.27.0228.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2} \cos^{-1}\left(\frac{2+z^2}{z^2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0229.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right)$

01.29.27.0230.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cos^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) \geq 0 \lor \operatorname{Im}(z) \geq 0 \lor \operatorname{Im}(z) < -1$$

01.29.27.0231.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \cos^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.0232.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right)$

01.29.27.0233.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cos^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 0 \lor \operatorname{Im}(z) \leq -1$$

01.29.27.0234.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \cos^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.0235.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z+i}{2z}}\right)$

01.29.27.0236.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right)$

01.29.27.0237.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cos^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) \leq 0 \lor \operatorname{Im}(z) \leq 0 \lor \operatorname{Im}(z) > 1 \land \operatorname{Re}(z) \geq 0$$

01.29.27.0238.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2 i \cos^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right) /;\ 0 < \operatorname{Im}(z) \leq 1 \land \operatorname{Re}(z) > 0$$

01.29.27.0239.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2z}}\right)$

01.29.27.0240.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cos^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2z}}\right) /;\ \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) < 0 \lor \operatorname{Im}(z) \geq 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.0241.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2 i \cos^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2z}}\right) /;\ 0 \leq \operatorname{Im}(z) < 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.0242.01

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

Involving $\operatorname{csch}^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z-i}{2z}}\right)$

01.29.27.0243.01

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

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

01.29.27.0244.01

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

01.29.27.0245.01

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

01.29.27.0246.01

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

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

01.29.27.0247.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i\cos^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; 0 \le \arg(z) < \pi$$

01.29.27.0248.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i\cos^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0249.01

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

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

01.29.27.0250.01

$$\operatorname{csch}^{-1}(z) = -i\cos^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0251.01

$$\operatorname{csch}^{-1}(z) = i\cos^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0252.01

$$\operatorname{csch}^{-1}(z) = -\pi i + i\cos^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0253.01

$$\operatorname{csch}^{-1}(z) = \pi i - i\cos^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0254.01

$$\operatorname{csch}^{-1}(z) = \frac{z^{3/2}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\sqrt{-\frac{1}{z^2}}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)\right) - \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

01.29.27.0255.01

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

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

01.29.27.0256.01

$$\operatorname{csch}^{-1}(z) = -i \cos^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0257.01

$$\operatorname{csch}^{-1}(z) = i \cos^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\, z \in \mathbb{R} \land i\, z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0258.01

$$\operatorname{csch}^{-1}(z) = -\pi\, i + i \cos^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.0259.01

$$\operatorname{csch}^{-1}(z) = \pi\, i - i \cos^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.0260.01

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

01.29.27.0261.01

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

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

01.29.27.0262.01

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

01.29.27.0263.01

$$\operatorname{csch}^{-1}(z) = i \cos^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0264.01

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

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

01.29.27.0265.01

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

01.29.27.0266.01

$$\operatorname{csch}^{-1}(z) = i \cos^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0267.01

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

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

01.29.27.0268.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} - \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2}\right) /;\ 0 < \arg(z) \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee |z| \geq \sqrt{2} \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.0269.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2} \cos^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2}\right) - \frac{\pi i}{4} /;\ -\pi < \arg(z) \leq -\frac{1}{4}(3\pi) \bigvee -\frac{\pi}{4} \leq \arg(z) \leq 0 \bigvee |z| \geq \sqrt{2} \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.0270.01

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

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

Involving $\operatorname{csch}^{-1}(i z)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0271.01

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

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

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

01.29.27.0272.01

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

01.29.27.0273.01

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

01.29.27.0274.01

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

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

01.29.27.0275.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = i \cos^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) \geq 0$$

01.29.27.0276.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} - i \cos^{-1}\left(\sqrt{-\frac{1}{z}}\right) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.0277.01

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

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

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

01.29.27.0278.01

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

01.29.27.0279.01

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

01.29.27.0280.01

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

Involving $\operatorname{csch}^{-1}\left(\sqrt{c\, z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\cos^{-1}\left(\frac{i}{z}\right)$

01.29.27.0281.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = i\cos^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.0282.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{\pi i}{2} - i\cos^{-1}\left(\frac{i}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.0283.01

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

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

01.29.27.0284.01

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

01.29.27.0285.01

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

01.29.27.0286.01

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

Involving $\operatorname{csch}^{-1}\left(a\,(b\, z^c)^m\right)$

Involving $\operatorname{csch}^{-1}(a\,(b\, z^c)^m)$ and $\cos^{-1}\left(\frac{i}{a}\, b^{-m}\, z^{-m\, c}\right)$

01.29.27.0287.01

$$\operatorname{csch}^{-1}(a\,(b\,z^c)^m) = -\frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\left(\frac{\pi}{2} - \cos^{-1}\!\left(\frac{i\,b^{-m}\,z^{-m\,c}}{a}\right)\right) /;\ 2\,m \in \mathbb{Z}$$

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

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

01.29.27.0288.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i\cos^{-1}\left(\sqrt{z}\right) /;\ 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0289.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i\cos^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0290.01

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

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

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

01.29.27.0291.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i\cos^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) > 0$$

01.29.27.0292.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i\cos^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) \le 0$$

01.29.27.0293.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\sqrt{1-z}\,\sqrt{\frac{1}{z-1}}\,\cos^{-1}\left(\sqrt{z}\right)$$

01.29.27.0294.01

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

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

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

01.29.27.0295.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{i}{2}\left(\cos^{-1}(z)-\pi\right) /; \operatorname{Im}(z)>0 \lor (z\in\mathbb{R} \land z<-1)$$

01.29.27.0296.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{i}{2}\left(\pi-\cos^{-1}(z)\right) /; \operatorname{Im}(z)<0 \lor (z\in\mathbb{R} \land z>-1)$$

01.29.27.0297.01

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

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

01.29.27.0298.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{i}{2}\cos^{-1}(z) /; \operatorname{Im}(z)<0 \lor (z\in\mathbb{R} \land z>1)$$

01.29.27.0299.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{i}{2}\cos^{-1}(z) /; 0<\arg(z)\leq\pi \bigvee (z\in\mathbb{R} \land 0<z<1)$$

01.29.27.0300.01

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

01.29.27.0301.01

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

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

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

01.29.27.0302.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{i}{2}\left(\cos^{-1}(z)-\pi\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.0303.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{i}{2}\left(\pi-\cos^{-1}(z)\right) /; \operatorname{Im}(z) < 0$$

01.29.27.0304.01

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

01.29.27.0305.01

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

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

01.29.27.0306.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{i}{2}\cos^{-1}(z) /; \operatorname{Im}(z) \leq 0$$

01.29.27.0307.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{i}{2}\cos^{-1}(z) /; \operatorname{Im}(z) > 0$$

01.29.27.0308.01

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

01.29.27.0309.01

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

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

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

01.29.27.0310.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0311.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\,/;\,\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0312.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\left(\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi\right)\,/;\,(z \in \mathbb{R} \land z < 0)$$

01.29.27.0313.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sqrt{z}\,\sqrt{\frac{1}{z}}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)\right)$$

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

01.29.27.0314.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)\,/;\,0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0315.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)\,/;\,\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0316.01

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

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

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

01.29.27.0317.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\,/;\,\operatorname{Im}(z) > 0$$

01.29.27.0318.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\,/;\,-\pi < \arg(z) \le 0$$

01.29.27.0319.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\left(\pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)\,/;\,(z \in \mathbb{R} \land z < 0)$$

01.29.27.0320.01

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

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

01.29.27.0321.01

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

01.29.27.0322.01

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

01.29.27.0323.01

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

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

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

01.29.27.0324.01

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

01.29.27.0325.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\cos^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z)<0$$

01.29.27.0326.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\left(\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)-\pi\right) /; (z\in\mathbb{R}\land z<0)$$

01.29.27.0327.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{1}{1-z}}\,\sqrt{z-1}\left(\sqrt{z}\,\sqrt{\frac{1}{z}}\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)-\frac{\pi}{2}\right)$$

01.29.27.0328.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = z\sqrt{-\frac{1}{z^2}}\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)-\frac{\pi}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}$$

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

01.29.27.0329.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.0330.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.0331.01

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

01.29.27.0332.01

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

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

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

01.29.27.0333.01

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

01.29.27.0334.01

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

01.29.27.0335.01

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

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

01.29.27.0336.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = -\frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0337.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{1}{2}\, i \cos^{-1}\left(\frac{1}{z}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0338.01

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

01.29.27.0339.01

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

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

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

01.29.27.0340.01

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

01.29.27.0341.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\, i \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0342.01

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

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

01.29.27.0343.01

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

01.29.27.0344.01

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

01.29.27.0345.01

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

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

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

01.29.27.0346.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0347.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) \leq 0$$

01.29.27.0348.01

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

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

01.29.27.0349.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\frac{1}{2}\,i\cos^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) \geq 0$$

01.29.27.0350.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.0351.01

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

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a z^c - 1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a z^c - 1}}\right)$ and $\cos^{-1}\left(\sqrt{a}\, z^{c/2}\right)$

01.29.27.0352.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2 - 1}}\right) = i\cos^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0353.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -i\cos^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0354.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -i\pi + i\cos^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0355.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = i\pi - i\cos^{-1}(z) \;/;\; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0009.01

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

01.29.27.0356.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{a\,z^c-1}}\right) = \frac{\sqrt{-a}\;z^{c/2}}{\sqrt{a\,z^c}}\left(\frac{\pi}{2} - \cos^{-1}\left(\sqrt{a}\;z^{c/2}\right)\right) + \frac{i\pi}{2}$$

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

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

01.29.27.0357.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\cos^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.0358.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -i\cos^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land i\,z < 0)$$

01.29.27.0359.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -i\pi + i\cos^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.29.27.0360.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\pi - i\cos^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0361.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) == \sqrt{1-z^2}\,\sqrt{\frac{1}{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\left(\frac{\pi}{2}-\cos^{-1}(z)\right)-\frac{\pi}{2}\right)$$

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

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

01.29.27.0362.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) == -i\cos^{-1}\left(\frac{1}{z}\right)\,/;\; 0<\arg(z)<\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.29.27.0363.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) == i\cos^{-1}\left(\frac{1}{z}\right)\,/;\; -\frac{\pi}{2}\leq\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.29.27.0364.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) == -\pi i+i\cos^{-1}\left(\frac{1}{z}\right)\,/;\; \frac{\pi}{2}\leq\arg(z)<\pi\bigvee(z\in\mathbb{R}\land z<-1)$$

01.29.27.0365.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) == \pi i-i\cos^{-1}\left(\frac{1}{z}\right)\,/;\; -\pi<\arg(z)<-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land -1<z<0)$$

01.29.27.0366.01

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

01.29.27.0367.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) == \frac{\sqrt{z^2}\,\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2}-\sqrt{\frac{1}{z^2}}\,z\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right)\right)$$

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

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

01.29.27.0368.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right) /;\ 0<\arg(z)<\frac{\pi}{2} \bigvee (z\in\mathbb{R}\land 0<z<1) \bigvee (i\,z\in\mathbb{R}\land i\,z>0)$$

01.29.27.0369.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2}<\arg(z)<0 \bigvee (z\in\mathbb{R}\land z>1)$$

01.29.27.0370.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \pi\,i - i\cos^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2}<\arg(z)<\pi \bigvee (z\in\mathbb{R}\land z<-1)$$

01.29.27.0371.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi\,i + i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\pi<\arg(z)<-\frac{\pi}{2} \bigvee (z\in\mathbb{R}\land -1<z<0) \bigvee (i\,z\in\mathbb{R}\land i\,z<0)$$

01.29.27.0372.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{1}{2}\pi\left(1-z\sqrt{\frac{1}{z^2}}\right)+\sqrt{\frac{1}{z^2}}\ z\cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0373.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = i\cos^{-1}\left(\frac{1}{z}\right) /;\ 0<\arg(z)<\frac{\pi}{2} \bigvee (i\,z\in\mathbb{R}\land i\,z>0)$$

01.29.27.0374.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2}<\arg(z)\leq 0$$

01.29.27.0375.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\pi\,i + i\cos^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2}<\arg(z)\leq\pi$$

01.29.27.0376.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \pi\,i - i\cos^{-1}\left(\frac{1}{z}\right) /;\ -\pi<\arg(z)<-\frac{\pi}{2} \bigvee (i\,z\in\mathbb{R}\land i\,z<0)$$

01.29.27.0377.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)=\frac{\sqrt{-z^2}}{\sqrt{z^2}}\left(\sqrt{\frac{1}{z^2}}\,z\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0378.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=-i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;0\leq\arg(z)<\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z>0)$$

01.29.27.0379.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2}<\arg(z)<0$$

01.29.27.0380.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=\pi\,i-i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}<\arg(z)<\pi$$

01.29.27.0381.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=-\pi\,i+i\cos^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land z<0)\bigvee(i\,z\in\mathbb{R}\land i\,z<0)$$

01.29.27.0382.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=-\sqrt{-\frac{1}{z^2}}\,\sqrt{z^2}\left(\frac{\pi}{2}-z\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right)\right)$$

01.29.27.0383.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)=-\frac{1}{2}\sqrt{\frac{1}{1-z}}\,\sqrt{\frac{1}{z+1}}\,\sqrt{z^2-1}\left(2\sqrt{\frac{1}{z^2}}\cos^{-1}\left(\frac{1}{z}\right)z-\pi\sqrt{\frac{1}{z^2}}\,z+\pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right)$ and $\cos^{-1}(z)$

01.29.27.0384.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right) = \frac{2 z^2}{\sqrt{-z^4}} \left(\frac{\pi}{2} - \cos^{-1}(z)\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.0385.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right) = \frac{\pi \sqrt{1-2 z^2} \sqrt{z^4-z^2}}{2 \sqrt{-z^2} \sqrt{1-z^2} \sqrt{2 z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{\sqrt{2}\, z+1}} \sqrt{\sqrt{2}\, z+1} + \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-\sqrt{2}\, z}} \sqrt{1-\sqrt{2}\, z} + \frac{\sqrt{z^4-z^2}}{z \sqrt{z^2-1}}\right) - \frac{2 \sqrt{1-2 z^2} \sqrt{z^4-z^2}}{\sqrt{-z^2} \sqrt{1-z^2} \sqrt{2 z^2-1}} \left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2 \sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2 \sqrt{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0386.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2 \sqrt{1-z^2}}\right) = -\frac{2 z \sqrt{z^2-1}}{\sqrt{z^2-z^4}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.0387.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2 \sqrt{1-z^2}}\right) = \frac{z}{2 \sqrt{-\frac{1}{z^2}} \sqrt{-z^4+3 z^2-2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-2} \left(\pi \left(\frac{z^3}{1-z^2} \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} - 2\right) + 4 \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2} \Big/ \sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2} \Big/ \sqrt{\sqrt{1-z^2}-1}\right)$ and $\cos^{-1}(z)$

01.29.27.0388.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{i}{2}\cos^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.29.27.0389.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{i}{2}\cos^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.29.27.0390.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\cos^{-1}(z)$

01.29.27.0391.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{i}{2}\cos^{-1}(z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1) \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0392.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{i}{2}\cos^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0393.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = -\frac{z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}\left(\frac{\pi}{2}-\cos^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$ and $\cos^{-1}(z)$

01.29.27.0394.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\,i\cos^{-1}(z)-\frac{\pi i}{4}\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}$$

01.29.27.0395.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4}-\frac{1}{2}\,i\cos^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)\leq\pi\bigvee-\frac{\pi}{2}<\arg(z)\leq 0$$

01.29.27.0396.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2}-\cos^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\cos^{-1}(z)$

01.29.27.0397.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{\pi i}{4}+\frac{1}{2}\,i\cos^{-1}(z)\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land-1<z<1)$$

01.29.27.0398.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \cos^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1) \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0399.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-1+z^2}}{2\sqrt{1-z^2}}\left(\cos^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2-1}-z}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0400.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) \;/;\; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.29.27.0401.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{i}{2} \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.0402.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.0403.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0404.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0405.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{z}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.29.27.0406.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0407.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{i}{2}\cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0408.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.0409.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0410.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2} i \cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0411.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z}\sqrt{z^2}}{z^{3/2}} - \frac{\sqrt{-z^2}}{z} + 2i\sqrt{z}\sqrt{\frac{1}{z}} - 2i\right) + \frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{1-z}\sqrt{-\frac{1}{z^2}}\sqrt{\frac{i}{z}}\, z\sqrt{-iz}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\tan^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\sqrt{-z^2-1}\right)$

01.29.27.0412.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{-z^2-1}\right) /;\ 0 < \arg(z) \le \pi$$

01.29.27.0413.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{-z^2-1}\right) /;\ -\pi < \arg(z) \le 0$$

01.29.27.0414.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{-z^2-1}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right)$

01.29.27.0415.01

$$\operatorname{csch}^{-1}(z) = -i\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0416.01

$$\operatorname{csch}^{-1}(z) = i\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0417.01

$$\operatorname{csch}^{-1}(z) = -\pi i - i\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /;\ (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0418.01

$$\operatorname{csch}^{-1}(z) = \pi i + i\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /;\ (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0419.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right)$$

01.29.27.0420.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) - \frac{i\pi\sqrt{-z^2}}{2z}\left(\frac{\sqrt{-iz-1}}{\sqrt{iz+1}} + \frac{\sqrt{iz-1}}{\sqrt{1-iz}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right)$

01.29.27.0421.01

$$\operatorname{csch}^{-1}(z) = -i\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /;\ 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0422.01

$$\operatorname{csch}^{-1}(z) = i\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0423.01

$$\operatorname{csch}^{-1}(z) = -\pi i + i\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /;\ (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0424.01

$$\operatorname{csch}^{-1}(z) = \pi i - i\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /;\ (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0425.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{\sqrt{-z}\sqrt{-z^2-1}}{\sqrt{z}}\sqrt{-\frac{1}{z^2+1}}\tan^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right)$

01.29.27.0426.01

$$\operatorname{csch}^{-1}(z) = -\frac{\sqrt{-z^2}}{2z}\tan^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2+2}\right) /;\ |\arg(z)| \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4} \bigvee |z| \ge \sqrt{2}$$

01.29.27.0427.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(-\sqrt{-\frac{1}{z^2}}\, z + i\sqrt{-\frac{i}{z}}\sqrt{-\frac{i\sqrt{2}+z}{z}}\sqrt{i\,z}\sqrt{\frac{z}{-i\sqrt{2}-z}} - i\sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}-z}{z}}\sqrt{-i\,z}\sqrt{\frac{z}{i\sqrt{2}-z}} + \frac{\sqrt{-\frac{z^2+1}{z^2}}}{z\sqrt{\frac{z^2+1}{z^4}}}\right) - \frac{\sqrt{-z^2}}{2\,z}\tan^{-1}\left(\frac{2\sqrt{-z^2-1}}{z^2+2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{2+z^2}{2\sqrt{-z^2-1}}\right)$

01.29.27.0428.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{4} - \frac{1}{2}\,i\tan^{-1}\left(\frac{z^2+2}{2\sqrt{-z^2-1}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0429.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{4} + \frac{1}{2}\,i\tan^{-1}\left(\frac{z^2+2}{2\sqrt{-z^2-1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0430.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{4} - \frac{1}{2}\,i\tan^{-1}\left(\frac{z^2+2}{2\sqrt{-z^2-1}}\right) /;\ (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0431.01

$$\operatorname{csch}^{-1}(z) = \frac{3\,\pi\,i}{4} + \frac{1}{2}\,i\tan^{-1}\left(\frac{z^2+2}{2\sqrt{-z^2-1}}\right) /;\ (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0432.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{4}\left(\frac{i\,z}{\sqrt{-z^2}} + \sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{\sqrt{-z^2}}{2\,z}\tan^{-1}\left(\frac{z^2+2}{2\sqrt{-z^2-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{i\,z+1}}\right)$

01.29.27.0433.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\,i\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{i\,z+1}}\right) /;\ i\,z \notin (-1,\,0)$$

01.29.27.0434.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{2} + 2\,i\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{i\,z+1}}\right) /;\ (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0435.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\,\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi\,i - 2\,i\,\sqrt{\frac{z}{z-i}}\,\sqrt{\frac{z-i}{z}}\,\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{i\,z+1}}\right)$$

01.29.27.0436.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2}\left(2\,\sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1}\,\sqrt{-\frac{i}{z}}\,\sqrt{i\,z} - 1\right) - 2\,i\,\sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1}\,\sqrt{-\frac{i}{z}}\,\sqrt{i\,z}\,\tan^{-1}\left(\frac{\sqrt{i\,z-1}}{\sqrt{i\,z+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{1-i\,z}}{\sqrt{-1-i\,z}}\right)$

01.29.27.0437.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\,i\tan^{-1}\left(\frac{\sqrt{1-i\,z}}{\sqrt{-1-i\,z}}\right)\;/;\; i\,z \notin (-1,\,1)$$

01.29.27.0438.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{2} - 2\,i\tan^{-1}\left(\frac{\sqrt{1-i\,z}}{\sqrt{-1-i\,z}}\right)\;/;\; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0439.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} + 2\,i\tan^{-1}\left(\frac{\sqrt{1-i\,z}}{\sqrt{-i\,z-1}}\right)\;/;\; (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0440.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\,\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi\,i - 2\,i\,\sqrt{\frac{z+i}{z}}\,\sqrt{\frac{z}{z+i}}\,\tan^{-1}\left(\frac{\sqrt{1-i\,z}}{\sqrt{-i\,z-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)$

01.29.27.0441.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\,i\tan^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)\;/;\; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) \geq 1 \lor \operatorname{Im}(z) < -1 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0442.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} + 2\,i\tan^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)\;/;\; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 1$$

01.29.27.0443.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{2} + 2\,i\tan^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)\;/;\; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0444.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\,\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi\,i - \frac{2\,\sqrt{i\,z-1}\,\sqrt{i\,z}}{\sqrt{-i+z}\,\sqrt{i+z}}\,\sqrt{\frac{-i+z}{z}}\,\tan^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$

01.29.27.0445.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 1 \lor \operatorname{Im}(z) \le -1$$

01.29.27.0446.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land -1 < \operatorname{Im}(z) \le 1 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0447.01

$$\operatorname{csch}^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0448.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} - \frac{1}{2}\right) \pi i + \frac{2 \sqrt{i z - 1} \sqrt{i z}}{\sqrt{-i-z} \sqrt{i-z}} \sqrt{\frac{-i+z}{z}} \tan^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$

01.29.27.0449.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \tan^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; i z \notin (-1, 0)$$

01.29.27.0450.01

$$\operatorname{csch}^{-1}(z) = -\frac{3 \pi i}{2} + 2 i \tan^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0451.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} - \frac{1}{2}\right) \pi i - 2 i \sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} \tan^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$

01.29.27.0452.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{i z + 1}}{\sqrt{i z - 1}}\right) /; i z \notin (-1, 1)$$

01.29.27.0453.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i z + 1}}{\sqrt{i z - 1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0454.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{i z + 1}}{\sqrt{i z - 1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0455.01

$$\operatorname{csch}^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{2i\sqrt{z(-i+z)}}{\sqrt{-1-iz}\sqrt{iz}}\tan^{-1}\left(\frac{\sqrt{iz+1}}{\sqrt{iz-1}}\right)$$

01.29.27.0456.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - 2\sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\sqrt{\frac{i}{z}}\sqrt{-iz}\right) + 2i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{iz+1}}\sqrt{iz+1}\tan^{-1}\left(\frac{\sqrt{iz+1}}{\sqrt{iz-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-1-iz}}{\sqrt{1-iz}}\right)$

01.29.27.0457.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2i\tan^{-1}\left(\frac{\sqrt{-1-iz}}{\sqrt{1-iz}}\right) /;\ iz \notin (0, 1)$$

01.29.27.0458.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2i\tan^{-1}\left(\frac{\sqrt{-1-iz}}{\sqrt{1-iz}}\right) /;\ (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.0459.01

$$\operatorname{csch}^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{2i\sqrt{z(-i+z)}}{\sqrt{1+z^2}}\sqrt{\frac{i+z}{z}}\tan^{-1}\left(\frac{\sqrt{-1-iz}}{\sqrt{1-iz}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$

01.29.27.0460.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2i\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /;\ \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) \geq 1 \lor \operatorname{Im}(z) < -1$$

01.29.27.0461.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2i\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /;\ \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 1 \lor (iz \in \mathbb{R} \land -1 < iz < 0)$$

01.29.27.0462.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2i\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /;\ (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.0463.01

$$\operatorname{csch}^{-1}(z) = i\pi\left(\frac{1}{2} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) - \frac{2\sqrt{-1-iz}\sqrt{-iz}}{\sqrt{-i+z}\sqrt{i+z}}\sqrt{\frac{i+z}{z}}\tan^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$

01.29.27.0464.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) \leq -1 \lor \operatorname{Im}(z) > 1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0465.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right) /; \operatorname{Re}(z) > 0 \land -1 < \operatorname{Im}(z) \leq 1$$

01.29.27.0466.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0467.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}}\right) + \frac{2 \sqrt{-1 - i z} \sqrt{-i z}}{\sqrt{-i - z} \sqrt{i - z}} \sqrt{\frac{i + z}{z}} \tan^{-1}\left(\frac{\sqrt{i - z}}{\sqrt{-i - z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$

01.29.27.0468.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \tan^{-1}\left(\sqrt{\frac{z - i}{z + i}}\right) /; i z \notin (0, 1)$$

01.29.27.0469.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \tan^{-1}\left(\sqrt{\frac{z - i}{z + i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0470.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}}\right) + 2 i \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}} \tan^{-1}\left(\sqrt{\frac{z - i}{z + i}}\right)$$

01.29.27.0471.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} \left(1 - 2 \sqrt{\frac{1}{1 - i z}} \sqrt{1 - i z} \sqrt{\frac{i}{z}} \sqrt{-i z}\right) + 2 i \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{\frac{1}{1 - i z}} \sqrt{1 - i z} \tan^{-1}\left(\sqrt{\frac{z - i}{z + i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(i z + \sqrt{-1 - z^2}\right)$

01.29.27.0472.01

$$\operatorname{csch}^{-1}(z) = 2 i \tan^{-1}\left(i z + \sqrt{-z^2 - 1}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0473.01

$$\operatorname{csch}^{-1}(z) = -2 i \tan^{-1}\left(i z + \sqrt{-z^2 - 1}\right) + \pi i /; -\pi < \arg(z) \leq 0$$

01.29.27.0474.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - \frac{i\sqrt{-z^2}}{z}\right) - \frac{2\sqrt{-z^2}}{z}\tan^{-1}\left(i z + \sqrt{-z^2 - 1}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(i z - \sqrt{-1 - z^2}\right)$

01.29.27.0475.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2 i \tan^{-1}\left(i z - \sqrt{-z^2 - 1}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0476.01

$$\operatorname{csch}^{-1}(z) = 2 i \tan^{-1}\left(i z - \sqrt{-z^2 - 1}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0477.01

$$\operatorname{csch}^{-1}(z) = \frac{2\sqrt{-z^2}}{z}\tan^{-1}\left(i z - \sqrt{-z^2 - 1}\right) - \frac{\pi i}{2}\left(1 + \frac{i\sqrt{-z^2}}{z}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right)$

01.29.27.0478.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2 i \tan^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0479.01

$$\operatorname{csch}^{-1}(z) = 2 i \tan^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0480.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2}\left(1 + \frac{i\sqrt{-z^2}}{z}\right) + \frac{2\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{1}{i z + \sqrt{-z^2 - 1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right)$

01.29.27.0481.01

$$\operatorname{csch}^{-1}(z) = 2 i \tan^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0482.01

$$\operatorname{csch}^{-1}(z) = -2 i \tan^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right) + \pi i /; -\pi < \arg(z) \leq 0$$

01.29.27.0483.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - \frac{i\sqrt{-z^2}}{z}\right) - \frac{2\sqrt{-z^2}}{z}\tan^{-1}\left(\frac{1}{i z - \sqrt{-z^2 - 1}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tan^{-1}(i z)$

01.29.27.0484.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2 i \tan^{-1}(i z) \;/;\; |z| < 1$$

01.29.27.0485.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i + 2 i \tan^{-1}(i z) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.0486.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i + 2 i \tan^{-1}(i z) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.0487.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2 i \tan^{-1}(i z) - \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.29.27.0488.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1 - i z}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2}\right) - \frac{2 i (1 - i z)}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2}\tan^{-1}(i z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.29.27.0489.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.0490.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0))$$

01.29.27.0491.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi\sqrt{-\frac{1}{z^2}}\, z - 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1$$

01.29.27.0492.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2 i \tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| > 1$$

01.29.27.0493.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{1}{2}\pi z\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) - \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tan^{-1}(i z^r)$

01.29.27.0494.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\tan^{-1}\left(i z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\tan^{-1}(i z)$

01.29.27.0495.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2i\tan^{-1}(iz) \;/;\; |z| < 1$$

01.29.27.0496.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i - 2i\tan^{-1}(iz) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.0497.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i - 2i\tan^{-1}(iz) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \le 0$$

01.29.27.0498.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2i\tan^{-1}(iz) + \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.29.27.0499.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tan^{-1}(iz) + \frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\tan^{-1}\left(\frac{i}{z}\right)$

01.29.27.0500.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i + 2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.0501.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i + 2i\tan^{-1}\left(\frac{i}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.0502.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi\sqrt{-\frac{1}{z^2}}\;z + 2\,i\,\tan^{-1}\left(\frac{i}{z}\right) /;\; |z| < 1$$

01.29.27.0503.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2\,i\,\tan^{-1}\left(\frac{i}{z}\right) /;\; |z| > 1$$

01.29.27.0504.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2} + 1\right) + \frac{2\,i\,(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\;\tan^{-1}\left(\frac{i}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\tan^{-1}(i\,z^r)$

01.29.27.0505.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2\,i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\;\tan^{-1}\left(i\,z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.29.27.0506.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{z}\right) /;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0507.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{z}\right) /;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0508.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\tan^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0509.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0510.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\; -\pi < \arg(z) \le 0$$

01.29.27.0511.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == -i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0512.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \frac{\sqrt{-1-z}}{\sqrt{1+z}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0513.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0514.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == -i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; -\pi < \arg(z) \leq 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0515.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0516.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) == \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \sqrt{-z-1}\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+1}}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.29.27.0517.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) == -i\tan^{-1}\left(\sqrt{z}\right) \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0518.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) == i\tan^{-1}\left(\sqrt{z}\right) \;/;\; -\pi < \arg(z) \leq 0$$

01.29.27.0519.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) == -\pi i + i\tan^{-1}\left(\sqrt{z}\right) \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0520.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1}-1\right)+\tan^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0521.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0522.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0523.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0524.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0525.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0526.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0527.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0528.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \sqrt{\frac{1}{z}}\sqrt{-\frac{z}{z+1}}\sqrt{z+1}\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\sqrt{z}\right)$

01.29.27.0529.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = i \tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0530.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -i \tan^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0531.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \pi i - i \tan^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0532.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \sqrt{-z-1}\, \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}}\, \sqrt{z+1}\right) - \tan^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0533.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0534.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0535.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0536.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \sqrt{-1-z}\, \sqrt{\frac{1}{1+z}}\, \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{z}}{2\sqrt{-z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0537.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0538.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \le 0$$

01.29.27.0539.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\sqrt{-z}}{\sqrt{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi \sqrt{z}}{2\sqrt{-z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.29.27.0540.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -i \tan^{-1}(\sqrt{z}) /; 0 \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.29.27.0541.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = i \tan^{-1}(\sqrt{z}) /; -\pi < \arg(z) < 0$$

01.29.27.0542.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\pi i + i \tan^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z < -1)$$

01.29.27.0543.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{-\frac{z+1}{z}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) - \tan^{-1}(\sqrt{z})\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0544.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 \le \arg(z) < \pi$$

01.29.27.0545.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) < 0$$

01.29.27.0546.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.29.27.0547.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0548.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \sqrt{-\frac{z+1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi \sqrt{-z-1} \sqrt{-z}}{2 \sqrt{z+1}} \sqrt{-\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0549.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0550.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0551.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = z \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi \sqrt{-z-1} \sqrt{-z}}{2 \sqrt{z+1}} \sqrt{-\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-1-z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right)$ and $\tan^{-1}(z)$

01.29.27.0552.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} - i \tan^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0553.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} + i \tan^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \le 0$$

01.29.27.0554.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi i}{2} - i \tan^{-1}(z) /; \frac{\pi}{2} < \arg(z) \le \pi$$

01.29.27.0555.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi i}{2} + i \tan^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0556.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\sqrt{z^2}}{z}\tan^{-1}(z)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0557.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = i\tan^{-1}\left(\frac{1}{z}\right) /;\ 0<\arg(z)<\frac{\pi}{2} \bigvee \frac{\pi}{2}<\arg(z)\leq\pi \bigvee (i\,z\in\mathbb{R}\wedge i\,z<-1)$$

01.29.27.0558.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -i\tan^{-1}\left(\frac{1}{z}\right) /;\ -\pi<\arg(z)<-\frac{\pi}{2} \bigvee -\frac{\pi}{2}<\arg(z)\leq 0 \bigvee (i\,z\in\mathbb{R}\wedge i\,z>1)$$

01.29.27.0559.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -i\tan^{-1}\left(\frac{1}{z}\right)-\pi\,i /;\ (i\,z\in\mathbb{R}\wedge -1<i\,z<0)$$

01.29.27.0560.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = i\tan^{-1}\left(\frac{1}{z}\right)-\pi\,i /;\ (i\,z\in\mathbb{R}\wedge 0<i\,z<1)$$

01.29.27.0561.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\pi\,i}{2}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}}+\frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right)-\frac{\sqrt{z^2}}{z}\tan^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$ and $\tan^{-1}(z)$

01.29.27.0562.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = i\tan^{-1}(z) /;\ 0<\arg(z)<\frac{\pi}{2} \bigvee -\pi<\arg(z)<-\frac{\pi}{2}$$

01.29.27.0563.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\tan^{-1}(z) /;\ \frac{\pi}{2}<\arg(z)\leq\pi \bigvee -\frac{\pi}{2}<\arg(z)\leq 0 \bigvee (i\,z\in\mathbb{R}\wedge -1<i\,z<1)$$

01.29.27.0564.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\tan^{-1}(z)-\pi\,i /;\ (i\,z\in\mathbb{R}\wedge i\,z>1)$$

01.29.27.0565.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\tan^{-1}(z)+\pi\, i\ /;\ (i\, z\in\mathbb{R}\land i\, z<-1)$$

01.29.27.0566.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\tan^{-1}(z)+\pi\, i\ /;\ (i\, z\in\mathbb{R}\land i\, z<-1)$$

01.29.27.0010.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi\, i}{2}\left(\sqrt{\frac{1}{1-i\, z}}\sqrt{1-i\, z}-\sqrt{\frac{1}{i\, z+1}}\sqrt{i\, z+1}\right)-\sqrt{-z^2-1}\sqrt{\frac{1}{z^2+1}}\tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0567.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \frac{\pi\, i}{2}-i\tan^{-1}\left(\frac{1}{z}\right)\ /;\ 0<\arg(z)<\frac{\pi}{2}$$

01.29.27.0568.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -\frac{\pi\, i}{2}+i\tan^{-1}\left(\frac{1}{z}\right)\ /;\ -\frac{\pi}{2}\le\arg(z)\le 0$$

01.29.27.0569.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \frac{\pi\, i}{2}+i\tan^{-1}\left(\frac{1}{z}\right)\ /;\ \frac{\pi}{2}\le\arg(z)\le\pi$$

01.29.27.0570.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -\frac{\pi\, i}{2}-i\tan^{-1}\left(\frac{1}{z}\right)\ /;\ -\pi<\arg(z)<-\frac{\pi}{2}$$

01.29.27.0571.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\tan^{-1}\left(\frac{1}{z}\right)-\frac{\pi\sqrt{-z^2}}{2\, z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$ and $\tan^{-1}(z)$

01.29.27.0572.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = i \tan^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.0573.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -i \tan^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.0574.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = i \tan^{-1}(z) + \pi i \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0575.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -i \tan^{-1}(z) + \pi i \;/;\; (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0576.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}}\,\sqrt{1-i z} - \sqrt{\frac{1}{i z+1}}\,\sqrt{i z+1}\right) - \sqrt{\frac{1}{z^2+1}}\,\sqrt{-z^2-1}\,\tan^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0577.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.0578.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.0579.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - i \tan^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.0580.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.0581.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{-z^2-1}\,\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{2 z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$ and $\tan^{-1}(z)$

01.29.27.0582.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -i\tan^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0583.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = i\tan^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0584.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -i\tan^{-1}(z) - \pi\,i \;/;\; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0585.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = i\tan^{-1}(z) - \pi\,i \;/;\; (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0586.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi\,i}{2}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right) - \frac{\sqrt{z}\,\sqrt{z^2+1}}{\sqrt{-z}}\,\sqrt{\frac{1}{z^2+1}}\,\tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0587.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi\,i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0588.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi\,i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0589.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi\,i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0590.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i \tan^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0591.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{z}\,\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2-1}}{2\sqrt{z^2+1}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\tan^{-1}(z)$

01.29.27.0592.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -i \tan^{-1}(z) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0593.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = i \tan^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0594.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -i \tan^{-1}(z) - \pi i /; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0595.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = i \tan^{-1}(z) - \pi i /; (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0596.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \sqrt{\frac{-z^2-1}{z^2}}\sqrt{\frac{z^2}{-z^2-1}}\left(\frac{\pi i}{2}\left(1-\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\right) - \frac{\sqrt{z}}{\sqrt{-z}}\tan^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0597.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /; 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.0598.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.0599.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - i\tan^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0) \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.0600.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} + i\tan^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.29.27.0601.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = z\sqrt{-\frac{1}{z^2}}\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}\sqrt{-z^2-1}}{2\sqrt{z^2+1}}\sqrt{-\frac{1}{z^2}}$$

01.29.27.0602.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) = -\sqrt{-\frac{1}{z^4}}\, z^2 \sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\tan^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4} \Big/ \sqrt{1-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4} \Big/ \sqrt{1-\sqrt{1+z^2}}\right)$ and $\tan^{-1}(z)$

01.29.27.0603.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) /; 0 < \arg(z) \le \pi$$

01.29.27.0604.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}(z)\;/;\;-\pi < \arg(z) \leq 0$$

01.29.27.0605.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\sqrt{-z^2}}{2z}\tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4} \Big/ \sqrt{1-\sqrt{1+z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0606.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}\;/;\;0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0607.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\;/;\;-\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0608.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\;/;\;\frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0609.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4}\;/;\;-\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0610.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{\sqrt{-z^2}}{2z}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\left(-i\sqrt{\frac{1}{z^2}}\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{z-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{z-\sqrt{1+z^2}}\right)$ and $\tan^{-1}(z)$

01.29.27.0611.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\tan^{-1}(z) - \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0612.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \geq 0$$

01.29.27.0613.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) - \frac{3\pi i}{4} \;/;\; (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0614.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(-i + i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z} + \sqrt{-\frac{1}{z}}\,\sqrt{z}\right) - \frac{1}{2}\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{z-\sqrt{1+z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0615.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) \;/;\; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0616.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0617.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} /;\ \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0618.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /;\ -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0619.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} /;\ (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0620.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) - 2\,i + i\sqrt{\frac{1}{i\,z+1}}\,\sqrt{i\,z+1} + i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}(z)$

01.29.27.0621.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2}\,i\tan^{-1}(z) /;\ 0 \leq \arg(z) < \pi$$

01.29.27.0622.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}\, i \tan^{-1}(z) \;/;\; -\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0623.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{z}{2}\sqrt{-\frac{1}{z^2}}\, \tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0624.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0625.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.0626.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.0627.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0628.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}\, z \sqrt{-\frac{1}{z^2}}\, \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4}\sqrt{-z^2}\sqrt{-\frac{1}{z^2}}\left(-i\sqrt{\frac{1}{z^2}}\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(z-\sqrt{1+z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(z-\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}(z)$

01.29.27.0629.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0630.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\, i \tan^{-1}(z) - \frac{\pi i}{4} \;/;$$
$$-\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0631.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}(z) - \frac{3\pi i}{4} \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0632.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{\pi i}{4}\left(\sqrt{\frac{1}{1-i z}}\,\sqrt{1-i z} + i\sqrt{\frac{1}{z}}\,\sqrt{-z} - 1\right) + \frac{1}{2}\sqrt{\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-i z}}\,\sqrt{1-i z}\,\tan^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2} \Big/ \left(z-\sqrt{1+z^2}\right)}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.29.27.0633.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) /;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0634.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) /;\; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0635.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\, i \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0636.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0637.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0638.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) =$$

$$\frac{1}{4}\pi\left(i + \sqrt{-\frac{1}{z^2}}\, z - \sqrt{-\frac{1}{z^2}}\,\sqrt{z^2} - i\sqrt{1+\frac{1}{z^2}}\,\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{1}{2}\sqrt{\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-i z}}\,\sqrt{1-i z}\,\tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\cot^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\sqrt{-z^2-1}\right)$

01.29.27.0639.01

$$\operatorname{csch}^{-1}(z) = -i\cot^{-1}\left(\sqrt{-z^2-1}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0640.01

$$\operatorname{csch}^{-1}(z) = i\cot^{-1}\left(\sqrt{-z^2-1}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0641.01

$$\operatorname{csch}^{-1}(z) = -\pi i - i\cot^{-1}\left(\sqrt{-z^2-1}\right) \;/;\; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0642.01

$$\operatorname{csch}^{-1}(z) = \pi i + i\cot^{-1}\left(\sqrt{-z^2-1}\right) \;/;\; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0643.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{z}{z-i}}\,\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\,\sqrt{\frac{z+i}{z}}\right) + \frac{\sqrt{-z^2}}{z}\cot^{-1}\left(\sqrt{-z^2-1}\right)$$

01.29.27.0644.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\cot^{-1}\left(\sqrt{-z^2-1}\right) - \frac{i\pi\sqrt{-z^2}}{2z}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z+1}} + \frac{\sqrt{i z-1}}{\sqrt{1-i z}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right)$

01.29.27.0645.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \cot^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0646.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \cot^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0647.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \cot^{-1}\left(\frac{1}{\sqrt{-z^2-1}}\right)\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right)$

01.29.27.0648.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0649.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0650.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /; (z \in \mathbb{R} \land z > 0) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0651.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - i \cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right) /; (z \in \mathbb{R} \land z < 0) \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0652.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \sqrt{-z^2-1}\,\sqrt{\frac{1}{-z^2-1}}\,\cot^{-1}\left(\sqrt{\frac{1}{-z^2-1}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right)$

01.29.27.0653.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2} i \cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0654.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2} i \cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0655.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2} i \cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0656.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2} i \cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0657.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4}\left(\frac{i z}{\sqrt{-z^2}} + \sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + \frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{2\sqrt{-z^2-1}}{2+z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{2+z^2}{2\sqrt{-z^2-1}}\right)$

01.29.27.0658.01

$$\operatorname{csch}^{-1}(z) = -\frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{2+z^2}{2\sqrt{-z^2-1}}\right) /; |\arg(z)| \leq \frac{\pi}{4} \bigvee \frac{3\pi}{4} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{3\pi}{4} \bigvee |z| \geq \sqrt{2}$$

01.29.27.0659.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(-\sqrt{-\frac{1}{z^2}}\, z + i\sqrt{-\frac{i}{z}}\sqrt{-\frac{i\sqrt{2}+z}{z}}\sqrt{i z}\sqrt{\frac{z}{-i\sqrt{2}-z}} - i\sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}-z}{z}}\sqrt{-i z}\sqrt{\frac{z}{i\sqrt{2}-z}} + \frac{\sqrt{-\frac{z^2+1}{z^2}}}{z\sqrt{\frac{z^2+1}{z^4}}}\right) - \frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{2+z^2}{2\sqrt{-z^2-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right)$

01.29.27.0660.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right) /; i z \notin (-1, 1)$$

01.29.27.0661.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i z-1}}{\sqrt{i z+1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0662.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0663.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}}\right) + \frac{2 i \sqrt{z(-i + z)}}{\sqrt{-1 - i z} \sqrt{i z}} \cot^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right)$$

01.29.27.0664.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - 2\sqrt{\frac{1}{1 - i z}} \sqrt{1 - i z} \sqrt{\frac{i}{z}} \sqrt{-i z}\right) + 2 i \sqrt{-\frac{i}{z}} \sqrt{i z} \sqrt{\frac{1}{i z + 1}} \sqrt{i z + 1} \cot^{-1}\left(\frac{\sqrt{i z - 1}}{\sqrt{i z + 1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{-1 - i z}}\right)$

01.29.27.0665.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{-1 - i z}}\right) /; i z \notin (0, 1)$$

01.29.27.0666.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{-1 - i z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0667.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}}\right) + \frac{2 i \sqrt{z(-i + z)}}{\sqrt{1 + z^2}} \sqrt{\frac{i + z}{z}} \cot^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{-1 - i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z + i}}{\sqrt{z - i}}\right)$

01.29.27.0668.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z + i}}{\sqrt{z - i}}\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) \geq 1 \lor \operatorname{Im}(z) < -1$$

01.29.27.0669.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{z + i}}{\sqrt{z - i}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0670.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z + i}}{\sqrt{z - i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0671.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}}\right) - \frac{2 \sqrt{-1 - i z} \sqrt{-i z}}{\sqrt{-i + z} \sqrt{i + z}} \sqrt{\frac{i + z}{z}} \cot^{-1}\left(\frac{\sqrt{z + i}}{\sqrt{z - i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$

01.29.27.0672.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) \leq -1 \lor \operatorname{Im}(z) > 1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0673.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land -1 < \operatorname{Im}(z) \leq 1$$

01.29.27.0674.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0675.01

$$\operatorname{csch}^{-1}(z) = i \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z+i}} \sqrt{\frac{z+i}{z}}\right) + \frac{2 \sqrt{-1-i z} \sqrt{-i z}}{\sqrt{-i-z} \sqrt{i-z}} \sqrt{\frac{i+z}{z}} \cot^{-1}\left(\frac{\sqrt{-i-z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$

01.29.27.0676.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; i z \notin (-1, 1)$$

01.29.27.0677.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0678.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0679.01

$$\operatorname{csch}^{-1}(z) = \left(\frac{1}{2} - \sqrt{\frac{z}{z+i}} \sqrt{\frac{z+i}{z}}\right) \pi i - \frac{2 i \sqrt{-i z - 1} \sqrt{-i z}}{\sqrt{i z + 1} \sqrt{i z}} \cot^{-1}\left(\sqrt{\frac{z+i}{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$

01.29.27.0680.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i z + 1}}{\sqrt{i z - 1}}\right) /; i z \notin (-1, 0)$$

01.29.27.0681.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0682.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - 2 i \sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} \cot^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$$

01.29.27.0683.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(2\sqrt{\frac{1}{i z+1}} \sqrt{i z+1} \sqrt{-\frac{i}{z}} \sqrt{i z} - 1\right) - 2 i \sqrt{\frac{1}{i z+1}} \sqrt{i z+1} \sqrt{-\frac{i}{z}} \sqrt{i z} \cot^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{i z-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right)$

01.29.27.0684.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right) /; i z \notin (-1, 1)$$

01.29.27.0685.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0686.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0687.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - 2 i \sqrt{\frac{z+i}{z}} \sqrt{\frac{z}{z+i}} \cot^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{1-i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$

01.29.27.0688.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) \geq 1 \lor \operatorname{Im}(z) < -1 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0689.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 1$$

01.29.27.0690.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0691.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2\sqrt{i z-1}\sqrt{i z}}{\sqrt{-i+z}\sqrt{i+z}}\sqrt{\frac{-i+z}{z}}\cot^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$

01.29.27.0692.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 1 \lor \operatorname{Im}(z) \leq -1$$

01.29.27.0693.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; \operatorname{Re}(z) > 0 \land -1 < \operatorname{Im}(z) \leq 1 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0694.01

$$\operatorname{csch}^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0695.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i + \frac{2\sqrt{i z-1}\sqrt{i z}}{\sqrt{-i-z}\sqrt{i-z}}\sqrt{\frac{-i+z}{z}}\cot^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$

01.29.27.0696.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; i z \notin (-1, 1)$$

01.29.27.0697.01

$$\operatorname{csch}^{-1}(z) = -\frac{3 \pi i}{2} - 2 i \cot^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0698.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \cot^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0699.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 z}{\sqrt{1-i z}\sqrt{-i z}}\sqrt{\frac{i+z}{z}}\cot^{-1}\left(\sqrt{\frac{z-i}{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(i z + \sqrt{-1-z^2}\right)$

01.29.27.0700.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2 i \cot^{-1}\left(i z + \sqrt{-1 - z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0701.01

$$\operatorname{csch}^{-1}(z) = 2 i \cot^{-1}\left(i z + \sqrt{-1 - z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0702.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2}\left(1 + \frac{i \sqrt{-z^2}}{z}\right) + \frac{2 \sqrt{-z^2}}{z} \cot^{-1}\left(i z + \sqrt{-1 - z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(i z - \sqrt{-1 - z^2}\right)$

01.29.27.0703.01

$$\operatorname{csch}^{-1}(z) = 2 i \cot^{-1}\left(i z - \sqrt{-1 - z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0704.01

$$\operatorname{csch}^{-1}(z) = -2 i \cot^{-1}\left(i z - \sqrt{-1 - z^2}\right) + \pi i /; -\pi < \arg(z) \leq 0$$

01.29.27.0705.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - \frac{i \sqrt{-z^2}}{z}\right) - \frac{2 \sqrt{-z^2}}{z} \cot^{-1}\left(i z - \sqrt{-1 - z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right)$

01.29.27.0706.01

$$\operatorname{csch}^{-1}(z) = 2 i \cot^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0707.01

$$\operatorname{csch}^{-1}(z) = -2 i \cot^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right) + \pi i /; -\pi < \arg(z) \leq 0$$

01.29.27.0708.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(1 - \frac{i \sqrt{-z^2}}{z}\right) - \frac{2 \sqrt{-z^2}}{z} \cot^{-1}\left(\frac{1}{i z + \sqrt{-1 - z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right)$

01.29.27.0709.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2 i \cot^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right) /; 0 < \arg(z) \le \pi$$

01.29.27.0710.01

$$\operatorname{csch}^{-1}(z) = 2 i \cot^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right) /; -\pi < \arg(z) \le 0$$

01.29.27.0711.01

$$\operatorname{csch}^{-1}(z) = \frac{2\sqrt{-z^2}}{z} \cot^{-1}\left(\frac{1}{i z - \sqrt{-1 - z^2}}\right) - \frac{\pi i}{2}\left(1 + \frac{i\sqrt{-z^2}}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\cot^{-1}(i z)$

01.29.27.0712.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i + 2 i \cot^{-1}(i z) /; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.0713.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i + 2 i \cot^{-1}(i z) /; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.0714.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi \sqrt{-\frac{1}{z^2}}\, z + 2 i \cot^{-1}(i z) /; |z| < 1$$

01.29.27.0715.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2 i \cot^{-1}(i z) /; |z| > 1$$

01.29.27.0716.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{1}{2}\pi z \sqrt{-\frac{1}{z^2}} \left(\frac{1 - i z}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} + 1\right) + \frac{2 i (1 - i z)}{1 + i z}\sqrt{\left(\frac{i z + 1}{i z - 1}\right)^2} \cot^{-1}(i z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.29.27.0717.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2 i \cot^{-1}\left(\frac{i}{z}\right) /; |z| < 1$$

01.29.27.0718.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i - 2 i \cot^{-1}\left(\frac{i}{z}\right) /; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.0719.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i - 2 i \cot^{-1}\left(\frac{i}{z}\right) /; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.0720.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2 i \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi \sqrt{-z^2}}{z} /; |z| > 1$$

01.29.27.0721.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{2(1-iz)}{1+iz} \sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\, i \cot^{-1}\left(\frac{i}{z}\right) - \frac{\pi \sqrt{-z^2}}{2z} \left(1 - \frac{1-iz}{1+iz} \sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\cot^{-1}(i z^r)$

01.29.27.0722.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2 i^{-\frac{i+z}{i-z} \sqrt{\left(\frac{i-z}{i+z}\right)^2}} \cot^{-1}\left(i z^{-\frac{i+z}{i-z} \sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\cot^{-1}(i z)$

01.29.27.0723.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i - 2 i \cot^{-1}(i z) /; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.0724.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i - 2 i \cot^{-1}(i z) /; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.0725.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi \sqrt{-\frac{1}{z^2}}\, z - 2 i \cot^{-1}(i z) /; |z| < 1$$

01.29.27.0726.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2 i \cot^{-1}(i z) /; |z| > 1$$

01.29.27.0727.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) - \frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\cot^{-1}(iz)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\cot^{-1}\left(\frac{i}{z}\right)$

01.29.27.0728.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2i\cot^{-1}\left(\frac{i}{z}\right) /; |z| < 1$$

01.29.27.0729.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i + 2i\cot^{-1}\left(\frac{i}{z}\right) /; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.0730.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i + 2i\cot^{-1}\left(\frac{i}{z}\right) /; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.0731.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2i\cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi\sqrt{-z^2}}{z} /; |z| > 1$$

01.29.27.0732.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{2i(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\cot^{-1}\left(\frac{i}{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\cot^{-1}(i z^r)$

01.29.27.0733.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2i^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\cot^{-1}\left(i z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.29.27.0734.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = i\cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0735.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -i\cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0736.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -i\cot^{-1}\left(\sqrt{z}\right) - \pi i \,/;\, (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0737.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}} - 1\right) - \frac{\sqrt{-1-z}}{\sqrt{1+z}}\cot^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0738.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\, \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0739.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\, \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0740.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0741.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, \operatorname{Im}(z) > 0$$

01.29.27.0742.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, -\pi < \arg(z) \le 0$$

01.29.27.0743.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0744.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, (z \in \mathbb{R} \land z < -1)$$

01.29.27.0745.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z-1}\right) = \frac{\sqrt{-z-1}}{\sqrt{z+1}}\left(\sqrt{z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.29.27.0746.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0747.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0748.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0749.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0750.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}} - \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\cot^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0751.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0752.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0753.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\pi i + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0754.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1} - 1\right) + \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0755.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0756.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0757.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = -\pi i - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0758.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-z}}\right) = \frac{1}{\sqrt{\frac{z}{z+1}}}\sqrt{-\frac{z}{z+1}}\left(\frac{\pi}{2}\left(\sqrt{\frac{1}{z+1}}\sqrt{z+1}-1\right) + \sqrt{z}\sqrt{\frac{1}{z}}\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.29.27.0759.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0760.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0761.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0762.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \sqrt{-1-z}\sqrt{\frac{1}{1+z}}\cot^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0763.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0764.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0765.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \pi i - i \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0766.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \sqrt{-z-1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0767.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0768.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = -i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0769.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \pi i + i \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0770.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z}}\right) = \sqrt{-z-1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) - \sqrt{z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\cot^{-1}\left(\sqrt{z}\right)$

01.29.27.0771.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\frac{\pi i}{2} + i \cot^{-1}\left(\sqrt{z}\right) /; 0 \leq \arg(z) < \pi$$

01.29.27.0772.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \frac{\pi i}{2} - i \cot^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) < 0$$

01.29.27.0773.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\frac{\pi i}{2} - i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0774.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \frac{\pi i}{2} + i\cot^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0775.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \sqrt{-\frac{z+1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{z+1}}\,\cot^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{-z-1}\,\sqrt{-z}}{2\sqrt{z+1}}\sqrt{-\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0776.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0777.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) < 0$$

01.29.27.0778.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\pi i + i\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0779.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \sqrt{z}\,\sqrt{\frac{1}{z+1}}\,\sqrt{-\frac{z+1}{z}}\left(\frac{\pi}{2}\left(1-\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0780.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.29.27.0781.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0782.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = -\pi i - i\cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.0783.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-1-z}{z}}\right) = \sqrt{z}\,\sqrt{\frac{1}{z+1}}\,\sqrt{-\frac{z+1}{z}}\left(\frac{\pi}{2}\left(1-\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right)-\sqrt{z}\,\sqrt{\frac{1}{z}}\,\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-1-z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right)$ and $\cot^{-1}(z)$

01.29.27.0784.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = i\cot^{-1}(z)\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee\frac{\pi}{2}<\arg(z)\leq\pi\bigvee(i\,z\in\mathbb{R}\land i\,z<-1)$$

01.29.27.0785.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -i\cot^{-1}(z)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee-\frac{\pi}{2}<\arg(z)\leq 0\bigvee(i\,z\in\mathbb{R}\land i\,z>1)$$

01.29.27.0786.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -i\cot^{-1}(z)-\pi\,i\;/;\;(i\,z\in\mathbb{R}\land -1<i\,z<0)$$

01.29.27.0787.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = i\cot^{-1}(z)-\pi\,i\;/;\;(i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.29.27.0788.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\pi\,i}{2}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}}+\frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right)-\frac{\sqrt{z^2}}{z}\cot^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0789.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi\,i}{2}-i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;0<\arg(z)<\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z<-1)$$

01.29.27.0790.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi\,i}{2}+i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2}<\arg(z)\leq 0$$

01.29.27.0791.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = -\frac{\pi\,i}{2}-i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}<\arg(z)\leq\pi$$

01.29.27.0792.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\pi\,i}{2}+i\cot^{-1}\left(\frac{1}{z}\right)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z>1)$$

01.29.27.0793.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2-1}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}}\left(\frac{\sqrt{z^2}}{z}\cot^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$ and $\cot^{-1}(z)$

01.29.27.0794.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \frac{\pi i}{2} - i\cot^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.0795.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -\frac{\pi i}{2} + i\cot^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.29.27.0796.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \frac{\pi i}{2} + i\cot^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.29.27.0797.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -\frac{\pi i}{2} - i\cot^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0798.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\cot^{-1}(z) - \frac{\pi\sqrt{-z^2}}{2z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0799.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0800.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land -1 < i z < 1)$$

01.29.27.0801.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.29.27.0802.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0803.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{z}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0011.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) = \frac{\pi\, i}{2}\left(\sqrt{\frac{1}{1-i\, z}}\,\sqrt{1-i\, z} - \sqrt{\frac{1}{i\, z+1}}\,\sqrt{i\, z+1}\right) - \sqrt{-z^2-1}\,\sqrt{\frac{1}{z^2+1}}\,\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$ and $\cot^{-1}(z)$

01.29.27.0804.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\, i}{2} - i\cot^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.0805.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi\, i}{2} + i\cot^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \le 0$$

01.29.27.0806.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi\, i}{2} - i\cot^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \le \pi$$

01.29.27.0807.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\, i}{2} + i\cot^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.0808.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{-z^2-1}\,\cot^{-1}(z) - \frac{\pi\sqrt{-z^2}}{2\, z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0809.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.0810.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.0811.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) + \pi i /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.0812.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) + \pi i /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.0813.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(\sqrt{\frac{1}{1-i z}}\sqrt{1-i z} - \sqrt{\frac{1}{i z+1}}\sqrt{i z+1}\right) - \sqrt{\frac{1}{z^2+1}}\sqrt{-z^2-1}\cot^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$ and $\cot^{-1}(z)$

01.29.27.0814.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + i\cot^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.0815.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - i\cot^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.0816.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - i\cot^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.0817.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + i \cot^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0818.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\cot^{-1}(z) + \frac{\pi\sqrt{-z^2-1}}{2\sqrt{z^2+1}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0819.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -i \cot^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0820.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = i \cot^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0821.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = -i \cot^{-1}\left(\frac{1}{z}\right) - \pi i \;/;\; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0822.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = i \cot^{-1}\left(\frac{1}{z}\right) - \pi i \;/;\; (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0823.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right) - \frac{\sqrt{z}\sqrt{z^2+1}}{\sqrt{-z}}\sqrt{\frac{1}{z^2+1}}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\cot^{-1}(z)$

01.29.27.0824.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} + i\cot^{-1}(z) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0825.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} - i\cot^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0826.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -\frac{\pi i}{2} - i\cot^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0827.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \frac{\pi i}{2} + i\cot^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0828.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = z\sqrt{-\frac{1}{z^2}}\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\cot^{-1}(z) + \frac{\pi\sqrt{-z^2}\sqrt{-z^2-1}}{2\sqrt{z^2+1}}\sqrt{-\frac{1}{z^2}}$$

01.29.27.0829.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) = -\sqrt{-\frac{1}{z^4}}\, z^2\sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\cot^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0830.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0831.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0832.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = -i\cot^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0833.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = i\cot^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0834.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{-z^2-1}{z^2}}\right) = \sqrt{\frac{-z^2-1}{z^2}}\,\sqrt{\frac{z^2}{-z^2-1}}\left(\frac{\pi\, i}{2}\left(1-\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1}\right) - \frac{\sqrt{z}}{\sqrt{-z}}\cot^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{1-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{1-\sqrt{1+z^2}}\right)$ and $\cot^{-1}(z)$

01.29.27.0835.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z) - \frac{\pi\, i}{4} \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.0836.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z) + \frac{\pi\, i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.0837.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}\, i\cot^{-1}(z) + \frac{\pi\, i}{4} \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.0838.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi\, i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.29.27.0839.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{\sqrt{-z^2}}{2z}\cot^{-1}(z) + \frac{\pi i}{4}\left(-i\sqrt{\frac{1}{z^2}}\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{1-\sqrt{1+z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0840.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \leq \pi$$

01.29.27.0841.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) \leq 0$$

01.29.27.0842.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\sqrt{-z^2}}{2z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{z-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4}\Big/\sqrt{z-\sqrt{1+z^2}}\right)$ and $\cot^{-1}(z)$

01.29.27.0843.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z) /;\ 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.0844.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z)\,/;\,-\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0845.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\cot^{-1}(z) + \frac{\pi\,i}{2}\,/;\,\frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.0846.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi\,i}{2}\,/;\,-\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.0847.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z) - \frac{\pi\,i}{2}\,/;\,(i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.0848.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z}\left(z\sqrt{\frac{1}{z^2}}-1\right) - 2\,i + i\sqrt{\frac{1}{i\,z+1}}\sqrt{i\,z+1} + i\sqrt{\frac{1}{1-i\,z}}\sqrt{1-i\,z}\right) + \frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{1-i\,z}}\sqrt{1-i\,z}\cot^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1+z^2)^{1/4} \Big/ \sqrt{z-\sqrt{1+z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0849.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}\,i\cot^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{4}\,/;\,-\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.0850.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}\;/;\;\operatorname{Im}(z)\geq 0$$

01.29.27.0851.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right)-\frac{3\pi i}{4}\;/;\;(i\,z\in\mathbb{R}\land i\,z>1)$$

01.29.27.0852.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1+z^2)^{1/4}}{\sqrt{z-\sqrt{1+z^2}}}\right) = \frac{\pi}{4}\left(-i+i\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}+\sqrt{-\frac{1}{z}}\,\sqrt{z}\right)-\frac{1}{2}\sqrt{\frac{1}{1-i\,z}}\,\sqrt{1-i\,z}\,\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}(z)$

01.29.27.0853.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z)-\frac{\pi i}{4}\;/;\;0\leq\arg(z)<\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z<-1)$$

01.29.27.0854.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z)+\frac{\pi i}{4}\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.29.27.0855.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z)+\frac{\pi i}{4}\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(i\,z\in\mathbb{R}\land -1<i\,z<0)$$

01.29.27.0856.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z)-\frac{\pi i}{4}\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(i\,z\in\mathbb{R}\land i\,z>1)\bigvee(z\in\mathbb{R}\land z<0)$$

01.29.27.0857.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}z\sqrt{-\frac{1}{z^2}}\cot^{-1}(z) + \frac{\pi i}{4}\sqrt{-z^2}\sqrt{-\frac{1}{z^2}}\left(-i\sqrt{\frac{1}{z^2}}\sqrt{-z^2} + \sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0858.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2}i\cot^{-1}\left(\frac{1}{z}\right)\,/;\,0 \le \arg(z) < \pi$$

01.29.27.0859.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}i\cot^{-1}\left(\frac{1}{z}\right)\,/;\,-\pi < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0860.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{1-\sqrt{1+z^2}}}\right) = -\frac{z}{2}\sqrt{-\frac{1}{z^2}}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(z-\sqrt{1+z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2}\Big/\left(z-\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}(z)$

01.29.27.0861.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z)\,/;\,0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0862.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z)\,/;\,-\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0863.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{1}{2}i\cot^{-1}(z) + \frac{\pi i}{2}\,/;\,\frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0864.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}(z) - \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0865.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{i}{2}\cot^{-1}(z) - \frac{\pi i}{2} /; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0866.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{1}{4}\pi\left(i + \sqrt{-\frac{1}{z^2}}\, z - \sqrt{-\frac{1}{z^2}}\sqrt{z^2} - i\sqrt{1+\frac{1}{z^2}}\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{1}{2}\sqrt{\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\cot^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1+z^2} \Big/ \left(z-\sqrt{1+z^2}\right)}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.29.27.0867.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0$$

01.29.27.0868.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{1}{2} i \cot^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /;$$

$$-\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0869.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = -\frac{i}{2}\cot^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} /; (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0870.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{z-\sqrt{1+z^2}}}\right) = \frac{\pi i}{4}\left(\sqrt{\frac{1}{1-i z}}\sqrt{1-i z} + i\sqrt{\frac{1}{z}}\sqrt{-z} - 1\right) + \frac{1}{2}\sqrt{\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-i z}}\sqrt{1-i z}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}(i z)$

01.29.27.0012.01

$$\operatorname{csch}^{-1}(z) = i \csc^{-1}(i z)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.29.27.0871.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2}\left(\csc^{-1}\left(\frac{z^2}{z^2+2}\right) - \frac{\pi}{2}\right) /; 0 \leq \arg(z) < \pi$$

01.29.27.0872.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2}\left(\frac{\pi}{2} - \csc^{-1}\left(\frac{z^2}{z^2+2}\right)\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0873.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\sqrt{-\frac{1}{z^2}}\, z\left(\frac{\pi}{2} - \csc^{-1}\left(\frac{z^2}{z^2+2}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right)$

01.29.27.0874.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) \geq 0 \lor \operatorname{Im}(z) \geq 0 \lor \operatorname{Im}(z) < -1$$

01.29.27.0875.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.0876.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \frac{2\sqrt{i z - 1}\,\sqrt{i z}}{\sqrt{z}\,\sqrt{i+z}} \csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right)$

01.29.27.0877.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 0 \lor \operatorname{Im}(z) \leq -1$$

01.29.27.0878.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.0879.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \frac{2\sqrt{i z - 1}\,\sqrt{i z}}{\sqrt{-i - z}\,\sqrt{-z}} \csc^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{-z - i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\sqrt{\frac{2 z}{z+i}}\right)$

01.29.27.0880.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \csc^{-1}\left(\sqrt{\frac{2 z}{z + i}}\right) /; i z \notin (0, 1)$$

01.29.27.0881.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2 i \csc^{-1}\left(\sqrt{\frac{2 z}{z + i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0882.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \sqrt{\frac{z}{z + i}} \sqrt{\frac{z + i}{z}} \csc^{-1}\left(\sqrt{\frac{2 z}{z + i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{i-z}}\right)$

01.29.27.0883.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \csc^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{i - z}}\right) /; \operatorname{Re}(z) \le 0 \lor \operatorname{Im}(z) \le 0 \lor \operatorname{Im}(z) > 1 \land \operatorname{Re}(z) \ge 0$$

01.29.27.0884.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \csc^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{i - z}}\right) /; 0 < \operatorname{Im}(z) \le 1 \land \operatorname{Re}(z) > 0$$

01.29.27.0885.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \frac{2 i \sqrt{-z}}{\sqrt{i - z}} \sqrt{\frac{z - i}{z}} \csc^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{i - z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z-i}}\right)$

01.29.27.0886.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \csc^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z - i}}\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) < 0 \lor \operatorname{Im}(z) \ge 1 \land \operatorname{Re}(z) \le 0$$

01.29.27.0887.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \csc^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z - i}}\right) /; 0 \le \operatorname{Im}(z) < 1 \land \operatorname{Re}(z) \le 0$$

01.29.27.0888.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \frac{2 i \sqrt{z}}{\sqrt{z-i}} \sqrt{\frac{z-i}{z}} \csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\sqrt{\frac{2z}{z-i}}\right)$

01.29.27.0889.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \csc^{-1}\left(\sqrt{\frac{2z}{z-i}}\right) /; i z \notin (-1, 0)$$

01.29.27.0890.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2 i \csc^{-1}\left(\sqrt{\frac{2z}{z-i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0891.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} \csc^{-1}\left(\sqrt{\frac{2z}{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\sqrt{-z^2}\right)$

01.29.27.0892.01

$$\operatorname{csch}^{-1}(z) = -i \csc^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0893.01

$$\operatorname{csch}^{-1}(z) = i \csc^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0894.01

$$\operatorname{csch}^{-1}(z) = -\frac{z}{\sqrt{-z^2}} \csc^{-1}\left(\sqrt{-z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$

01.29.27.0895.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0896.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0897.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - i \csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0898.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + i \csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.0899.01

$$\operatorname{csch}^{-1}(z) = \frac{z^{3/2}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}} \sqrt{-\frac{1}{z^2}} \csc^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) - \frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$

01.29.27.0900.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0901.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0902.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - i \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0903.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + i \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0904.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{-\frac{1}{z^2}}\left(\frac{\sqrt{-z^2\left(z^2+1\right)}}{\sqrt{z^2}\sqrt{-z^2-1}} \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) - \frac{\pi}{2}\right)$$

01.29.27.0905.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{-\frac{1}{z^2}}\left(\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{\frac{i-z}{i+z}}\sqrt{\frac{i+z}{i-z}} \csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$

01.29.27.0906.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) /;\ 0 \le \arg(z) < \pi$$

01.29.27.0907.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.0908.01

$$\operatorname{csch}^{-1}(z) = z \sqrt{-\frac{1}{z^2}} \left(\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.29.27.0909.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + i \csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;\ 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.0910.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.0911.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - i \csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;\ (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0912.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + i \csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;\ (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.0913.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z}\,\sqrt{-z^2-1}}{\sqrt{-z}} \sqrt{-\frac{1}{z^2+1}}\, \csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{1}{2} \pi z \sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\csc^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)$

01.29.27.0914.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2} \csc^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right) /; 0 < \arg(z) \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee |z| \ge \sqrt{2} \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.0915.01

$$\operatorname{csch}^{-1}(z) = -\frac{i}{2} \csc^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right) /; -\pi < \arg(z) \le -\frac{1}{4}(3\pi) \bigvee -\frac{\pi}{4} \le \arg(z) \le 0 \bigvee |z| \ge \sqrt{2} \bigwedge -\pi < \arg(z) \le 0$$

01.29.27.0916.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(i\sqrt{\frac{z}{z+i\sqrt{2}}}\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{i}{z}}\sqrt{-iz} - i\sqrt{\frac{z}{z-i\sqrt{2}}}\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz} - \frac{\sqrt{\frac{z^2+1}{z^4}}\,z}{\sqrt{-\frac{z^2+1}{z^2}}} - \sqrt{-\frac{1}{z^2}}\,z\right) - \frac{\sqrt{-iz-1}\sqrt{iz-1}\sqrt{-z}}{2\sqrt{z}\sqrt{z^2+1}} \csc^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)$$

Involving $\operatorname{csch}^{-1}(i z)$

Involving $\operatorname{csch}^{-1}(i z)$ and $\csc^{-1}(z)$

01.29.27.0013.01

$$\operatorname{csch}^{-1}(i z) = -i \csc^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\csc^{-1}\left(\sqrt{-z}\right)$

01.29.27.0917.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -i \csc^{-1}\left(\sqrt{-z}\right) /; 0 < \arg(z) \le \pi$$

01.29.27.0918.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = i \csc^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \le 0$$

01.29.27.0014.02

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\sqrt{z}}{\sqrt{-z}} \csc^{-1}\left(\sqrt{-z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.29.27.0919.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.0920.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.0921.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{z} \csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.29.27.0922.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \csc^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.0923.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \csc^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.0924.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{-\frac{1}{z}} \sqrt{z} \csc^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\csc^{-1}(i z)$

01.29.27.0925.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = i \csc^{-1}(i z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.0926.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -i \csc^{-1}(i z) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.0927.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{i \sqrt{z^2}}{z} \csc^{-1}(i z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$ and $\csc^{-1}(z)$

01.29.27.0928.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = i \csc^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi$$

01.29.27.0929.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -i \csc^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.29.27.0930.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -\frac{\sqrt{-z^2}}{z} \csc^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(a \left(b z^c\right)^m\right)$

Involving $\operatorname{csch}^{-1}(a (b z^c)^m)$ and $\csc^{-1}(i a b^m z^{m c})$

01.29.27.0931.01

$$\operatorname{csch}^{-1}(a (b z^c)^m) = \frac{i (b z^c)^m}{b^m z^{m c}} \csc^{-1}(i a b^m z^{m c}) \;/;\; 2 m \in \mathbb{Z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0932.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0933.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0934.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \left(\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0935.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0936.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0937.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0938.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \left(\sqrt{z} \sqrt{\frac{1}{z}} \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.0939.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0940.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i \csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) \le 0$$

01.29.27.0941.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{1-z} \sqrt{\frac{1}{z-1}} \left(\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\csc^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.0942.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0943.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \le 0$$

01.29.27.0944.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0945.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{1-z}\,\sqrt{\frac{1}{z-1}}\left(\sqrt{z}\,\sqrt{\frac{1}{z}}\,\csc^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0946.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right) /;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0947.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right) /;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0948.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\csc^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0949.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right) /;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0950.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right) /;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0951.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2c}{z+a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0952.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right)+\frac{\pi}{2}\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.0953.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right)+\frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.0954.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = -\frac{\sqrt{1+z}}{2}\sqrt{\frac{1}{-1-z}}\left(\csc^{-1}\left(\frac{1}{z}\right)+\frac{\pi}{2}\right)$$

01.29.27.0955.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2}{z+1}}\right) = -\frac{\sqrt{z}}{2}\sqrt{-\frac{1}{z}}\left(\csc^{-1}\left(\frac{1}{z}\right)+\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0956.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right) /; \operatorname{Im}(z) \leq 0$$

01.29.27.0957.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{i}{2}\left(\csc^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0958.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\sqrt{1-z}}{2}\sqrt{\frac{1}{z-1}}\left(\csc^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right)$$

01.29.27.0959.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\sqrt{-z}}{2}\sqrt{\frac{1}{z}}\left(\csc^{-1}\left(\frac{1}{z}\right)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.29.27.0960.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0961.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0962.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0963.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sqrt{z}\,\sqrt{\frac{1}{z}}\,\csc^{-1}\left(\sqrt{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.29.27.0964.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.0965.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; -\pi < \arg(z) \le 0$$

01.29.27.0966.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0967.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \sqrt{\frac{1}{z}}\,\sqrt{-z}\,\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{z}}{2\sqrt{-z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\csc^{-1}\left(\sqrt{z}\right)$

01.29.27.0968.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; 0 \le \arg(z) < \pi$$

01.29.27.0969.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.0970.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -i\left(\csc^{-1}\left(\sqrt{z}\right) + \frac{\pi}{2}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0971.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{1}{1-z}}\,\sqrt{z-1}\left(\sqrt{z}\,\sqrt{\frac{1}{z}}\,\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

01.29.27.0972.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = z\sqrt{-\frac{1}{z^2}}\,\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}$$

01.29.27.0973.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{1}{1-z}}\,\sqrt{z-1}\left(\sqrt{z}\,\sqrt{\frac{1}{z}}\,\csc^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right)$ and $\csc^{-1}(z)$

01.29.27.0974.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi$$

01.29.27.0975.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} /; -\pi < \arg(z) \leq 0$$

01.29.27.0976.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{\sqrt{-z}}{2\sqrt{z}}\csc^{-1}(z) + \frac{\pi\sqrt{-z^2}}{4z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right)$ and $\csc^{-1}(z)$

01.29.27.0977.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\,i\csc^{-1}(z) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0978.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \csc^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0979.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(\frac{\pi}{2} - \csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right)$ and $\csc^{-1}(z)$

01.29.27.0980.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.0981.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.0982.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\csc^{-1}(z) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right)$ and $\csc^{-1}(z)$

01.29.27.0983.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \csc^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi$$

01.29.27.0984.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{\pi i}{4} + \frac{1}{2} i \csc^{-1}(z) \;/;\; -\pi < \arg(z) \leq 0$$

01.29.27.0985.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}}\left(\frac{\pi}{2} - \csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right)$ and $\csc^{-1}(z)$

01.29.27.0986.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.0987.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{i}{2}\csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \leq 0$$

01.29.27.0988.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{1}{2}\sqrt{-z}\sqrt{\frac{1}{z}}\left(\csc^{-1}(z) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$ and $\csc^{-1}(z)$

01.29.27.0989.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{1}{2} i \csc^{-1}(z) - \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) \geq 0$$

01.29.27.0990.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\frac{i}{2}\csc^{-1}(z) + \frac{\pi i}{4} \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.0991.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{\sqrt{z}}{2}\sqrt{-\frac{1}{z}}\left(\csc^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0992.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{i\pi}{2} - i\csc^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0993.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{i\pi}{2} + i\csc^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.0994.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\frac{i\pi}{2} - i\csc^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.0995.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{i\pi}{2} + i\csc^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0996.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.0997.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi i}{2} - i\csc^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.0998.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.0999.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\frac{i\pi}{2} - i\csc^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1000.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{i\pi}{2} + i\csc^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1001.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \sqrt{1-z^2}\sqrt{\frac{1}{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\csc^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.29.27.1002.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + i\csc^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1003.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i\csc^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1004.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - i\csc^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1005.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + i\csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1006.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{\frac{1}{z^2}}\sqrt{-z^2}\csc^{-1}(z) /; z \notin (-1, 1)$$

01.29.27.0015.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2}\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.29.27.1007.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} + i\csc^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1008.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} - i\csc^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1009.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi i}{2} + i \csc^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1010.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.1011.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \left(\frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\csc^{-1}(z)$

01.29.27.1012.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} - i \csc^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1013.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} + i \csc^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.1014.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\frac{\pi i}{2} - i \csc^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1015.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi i}{2} + i \csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.1016.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}} z \csc^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.29.27.1017.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2} + i \csc^{-1}(z) \;/;\; 0 \le \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 0)$$

01.29.27.1018.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi i}{2} - i \csc^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1019.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi i}{2} + i \csc^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1020.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{\pi i}{2} - i \csc^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0) \bigvee (i z \in \mathbb{R} \wedge i z < 0)$$

01.29.27.1021.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\sqrt{-\frac{1}{z^2}} \sqrt{z^2} \left(\frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.1022.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right) = \frac{2 z^2}{\sqrt{-z^4}} \csc^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{4} \le |\arg(z)| \le \frac{3 \pi}{4}$$

01.29.27.1023.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2\,z\,\sqrt{z^2-1}}\right) = \frac{\pi\,\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{2\,\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}}\left(\frac{\sqrt{z^2}}{z}-\sqrt{\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{\sqrt{2}\,z+1}}\,\sqrt{\sqrt{2}\,z+1}+\sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-\sqrt{2}\,z}}\,\sqrt{1-\sqrt{2}\,z}+\frac{\sqrt{z^4-z^2}}{z\,\sqrt{z^2-1}}\right)-\frac{2\,\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$ and $\csc^{-1}(z)$

01.29.27.1024.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\,\sqrt{1-z^2}}\right) = -\frac{2\,z\,\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\csc^{-1}(z) \;/;\; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\,\pi}{4}$$

01.29.27.1025.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\,\sqrt{1-z^2}}\right) = \frac{z}{2\,\sqrt{-\frac{1}{z^2}}\,\sqrt{-z^4+3\,z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\,\sqrt{z^2-2}\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\,\sqrt{\frac{1-z^2}{z^4}}+\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{z}}\,\sqrt{\frac{z}{z+\sqrt{2}}}\,\sqrt{\frac{z+\sqrt{2}}{z}}\,\sqrt{z}+\sqrt{1-\frac{\sqrt{2}}{z}}\,\sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{z}{z-\sqrt{2}}}\right)-4\csc^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.1026.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = -\frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.1027.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1028.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.1029.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = -\frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1) \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1030.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{i}{2}\csc^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1031.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = -\frac{z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\bigg/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2} \Big/ \left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.1032.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \le \frac{\pi}{2} \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.27.1033.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\frac{\pi}{2} < \arg(z) \le 0$$

01.29.27.1034.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^4}}{2z^2}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\csc^{-1}\left(\frac{1}{z}\right)$

01.29.27.1035.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \le \frac{\pi}{2} \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 1)$$

01.29.27.1036.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\,i\csc^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1) \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1037.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{\sqrt{-1+z^2}}{2\sqrt{1-z^2}}\csc^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z} \Big/ \sqrt{\sqrt{z^2-1}-z}\right)$ and $\csc^{-1}(z)$

01.29.27.1038.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2} i \csc^{-1}(z) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1039.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{i}{2} \csc^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1040.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{2} - \frac{1}{2} i \csc^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1041.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{2} + \frac{1}{2} i \csc^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1042.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{2} - \frac{1}{2} i \csc^{-1}(z) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1043.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{z\,4} \sqrt{-z^2} \left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2} \sqrt{-\frac{1}{z}} \sqrt{\frac{i}{z}} \sqrt{i z} \sqrt{z} \csc^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\csc^{-1}(z)$

01.29.27.1044.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=\frac{1}{2}i\csc^{-1}(z)\;/;\;0<\arg(z)\le\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.29.27.1045.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=-\frac{i}{2}\csc^{-1}(z)\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.29.27.1046.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=\frac{\pi i}{2}+\frac{1}{2}i\csc^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)<\pi$$

01.29.27.1047.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=-\frac{\pi i}{2}-\frac{1}{2}i\csc^{-1}(z)\;/;\;-\pi<\arg(z)<-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land z<0)$$

01.29.27.1048.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=-\frac{\pi i}{2}+\frac{1}{2}i\csc^{-1}(z)\;/;\;(iz\in\mathbb{R}\land iz>0)$$

01.29.27.1049.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right)=$$

$$\frac{\pi}{4}\left(\frac{\sqrt{-z}\sqrt{z^2}}{z^{3/2}}-\frac{\sqrt{-z^2}}{z}+2i\sqrt{z}\sqrt{\frac{1}{z}}-2i\right)+\frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{1-z}\sqrt{-\frac{1}{z^2}}\sqrt{\frac{i}{z}}\,z\sqrt{-iz}\,\csc^{-1}(z)$$

Involving $\sec^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}(iz)$

01.29.27.0016.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i \sec^{-1}(i z)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}(-i z)$

01.29.27.0017.01

$$\operatorname{csch}^{-1}(z) = i \sec^{-1}(-i z) - \frac{i \pi}{2}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.29.27.1050.01

$$\operatorname{csch}^{-1}(z) = -\frac{i}{2} \sec^{-1}\left(\frac{z^2}{z^2+2}\right) /; 0 \leq \arg(z) < \pi$$

01.29.27.1051.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2} \sec^{-1}\left(\frac{z^2}{z^2+2}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1052.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2} \sqrt{-\frac{1}{z^2}}\, z \sec^{-1}\left(\frac{z^2}{z^2+2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z+i}}\right)$

01.29.27.1053.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \sec^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) \geq 0 \lor \operatorname{Im}(z) \geq 0 \lor \operatorname{Im}(z) < -1$$

01.29.27.1054.01

$$\operatorname{csch}^{-1}(z) = \frac{3 \pi i}{2} - 2 i \sec^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.1055.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \frac{2 \sqrt{i z - 1} \sqrt{i z}}{\sqrt{z} \sqrt{i+z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{z+i}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{-z-i}}\right)$

01.29.27.1056.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \sec^{-1}\left(\frac{\sqrt{-2 z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) < 0 \lor \operatorname{Im}(z) > 0 \lor \operatorname{Im}(z) \leq -1$$

01.29.27.1057.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2 i \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.1058.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \frac{2\sqrt{iz-1}\,\sqrt{iz}}{\sqrt{-i-z}\,\sqrt{-z}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2z}{z+i}}\right)$

01.29.27.1059.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2 i \sec^{-1}\left(\sqrt{\frac{2z}{z+i}}\right) /; i z \notin (0, 1)$$

01.29.27.1060.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2 i \sec^{-1}\left(\sqrt{\frac{2z}{z+i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1061.01

$$\operatorname{csch}^{-1}(z) = i \pi\left(\frac{1}{2} - \sqrt{\frac{z}{z+i}}\,\sqrt{\frac{z+i}{z}}\right) + 2 i \sqrt{\frac{z}{z+i}}\,\sqrt{\frac{z+i}{z}}\,\sec^{-1}\left(\sqrt{\frac{2z}{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i-z}}\right)$

01.29.27.1062.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \leq 0 \lor \operatorname{Im}(z) \leq 0 \lor \operatorname{Im}(z) > 1 \land \operatorname{Re}(z) \geq 0$$

01.29.27.1063.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2 i \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i-z}}\right) /; 0 < \operatorname{Im}(z) \leq 1 \land \operatorname{Re}(z) > 0$$

01.29.27.1064.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \frac{2 i \sqrt{-z}}{\sqrt{i-z}}\sqrt{\frac{z-i}{z}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i-z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right)$

01.29.27.1065.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2 i \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) < 0 \lor \operatorname{Im}(z) \geq 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.1066.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2i\sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right) /; 0 \leq \operatorname{Im}(z) < 1 \land \operatorname{Re}(z) \leq 0$$

01.29.27.1067.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \frac{2i\sqrt{z}}{\sqrt{z-i}} \sqrt{\frac{z-i}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2z}{z-i}}\right)$

01.29.27.1068.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2i\sec^{-1}\left(\sqrt{\frac{2z}{z-i}}\right) /; i z \notin (-1, 0)$$

01.29.27.1069.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2i\sec^{-1}\left(\sqrt{\frac{2z}{z-i}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1070.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2i\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{2z}{z-i}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\sqrt{-z^2}\right)$

01.29.27.1071.01

$$\operatorname{csch}^{-1}(z) = i\sec^{-1}\left(\sqrt{-z^2}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.29.27.1072.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - i\sec^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1073.01

$$\operatorname{csch}^{-1}(z) = \frac{z}{\sqrt{-z^2}} \left(\sec^{-1}\left(\sqrt{-z^2}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$

01.29.27.1074.01

$$\operatorname{csch}^{-1}(z) = -i\sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1075.01

$$\operatorname{csch}^{-1}(z) = i \sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.1076.01

$$\operatorname{csch}^{-1}(z) = -\pi\, i + i \sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.1077.01

$$\operatorname{csch}^{-1}(z) = \pi\, i - i \sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.29.27.1078.01

$$\operatorname{csch}^{-1}(z) = \frac{z^{3/2} \sqrt{-z^2-1}}{\sqrt{-z} \sqrt{z^2+1}} \sqrt{-\frac{1}{z^2}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)\right) - \frac{\pi\, z}{2} \sqrt{-\frac{1}{z^2}}$$

01.29.27.1079.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{\sqrt{z^2+1}} \left(\sqrt{-\frac{1}{z^2}} \sqrt{-z^2} \sqrt{-z^2-1}\right) \left(\sec^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) - \frac{1}{2} \pi \left(\frac{\sqrt{z} \sqrt{z^2+1}}{\sqrt{-z} \sqrt{-z^2-1}} + 1\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$

01.29.27.1080.01

$$\operatorname{csch}^{-1}(z) = -i \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; 0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.1081.01

$$\operatorname{csch}^{-1}(z) = i \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i\, z \in \mathbb{R} \land i\, z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1082.01

$$\operatorname{csch}^{-1}(z) = -\pi\, i + i \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.1083.01

$$\operatorname{csch}^{-1}(z) = \pi\, i - i \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) /; (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.1084.01

$$\operatorname{csch}^{-1}(z) = z \sqrt{-\frac{1}{z^2}} \left(\frac{\sqrt{-z^2 (z^2+1)}}{\sqrt{z^2} \sqrt{-z^2-1}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)\right) - \frac{\pi}{2}\right)$$

01.29.27.1085.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{-\frac{1}{z^2}}\left(\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{\frac{i-z}{i+z}}\sqrt{\frac{i+z}{i-z}}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)\right)-\frac{\pi}{2}\right)$$

01.29.27.1086.01

$$\operatorname{csch}^{-1}(z) = -\frac{i\pi}{2}\left(\sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\sqrt{\frac{i}{z}}\sqrt{-iz}-\sqrt{\frac{1}{iz+1}}\sqrt{iz+1}\sqrt{-\frac{i}{z}}\sqrt{iz}\right)-\sqrt{\frac{i+z}{i-z}}\,z\sqrt{z^2}\sqrt{-\frac{1}{z^4}}\sqrt{\frac{i-z}{i+z}}\sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$

01.29.27.1087.01

$$\operatorname{csch}^{-1}(z) = -i\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)\;/;\;0 \le \arg(z) < \pi$$

01.29.27.1088.01

$$\operatorname{csch}^{-1}(z) = i\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)\;/;\;\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1089.01

$$\operatorname{csch}^{-1}(z) = -z\sqrt{-\frac{1}{z^2}}\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.29.27.1090.01

$$\operatorname{csch}^{-1}(z) = -i\sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)\;/;\;0 \le \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1091.01

$$\operatorname{csch}^{-1}(z) = i\sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)\;/;\;-\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1092.01

$$\operatorname{csch}^{-1}(z) = -\pi i + i\sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)\;/;\;(i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1093.01

$$\operatorname{csch}^{-1}(z) = \pi i - i \sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1094.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z}\sqrt{-z^2-1}}{\sqrt{-z}} \sqrt{-\frac{1}{z^2+1}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)\right) - \frac{1}{2} \pi z \sqrt{-\frac{1}{z^2}}$$

01.29.27.1095.01

$$\operatorname{csch}^{-1}(z) = -\frac{i\pi}{2}\left(\sqrt{\frac{i-z}{z}}\sqrt{\frac{z}{i-z}} - \sqrt{-\frac{i+z}{z}}\sqrt{-\frac{z}{i+z}}\right) + \sqrt{\frac{i+z}{i-z}}\, z \sqrt{z^2} \left(-\sqrt{-\frac{1}{z^4}}\right) \sqrt{\frac{i-z}{i+z}} \sec^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)$

01.29.27.1096.01

$$\operatorname{csch}^{-1}(z) = \frac{i}{2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)\right) /; 0 < \arg(z) \le \frac{\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi \bigvee |z| \ge \sqrt{2} \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.1097.01

$$\operatorname{csch}^{-1}(z) = -\frac{i}{2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)\right) /; -\pi < \arg(z) \le -\frac{1}{4}(3\pi) \bigvee -\frac{\pi}{4} \le \arg(z) \le 0 \bigvee |z| \ge \sqrt{2} \bigwedge -\pi < \arg(z) \le 0$$

01.29.27.1098.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(i\sqrt{\frac{z}{z+i\sqrt{2}}}\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{i}{z}}\sqrt{-iz} - i\sqrt{\frac{z}{z-i\sqrt{2}}}\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz} - \frac{\sqrt{\frac{z^2+1}{z^4}}\, z}{\sqrt{-\frac{z^2+1}{z^2}}} - \sqrt{-\frac{1}{z^2}}\, z\right) - \frac{\sqrt{-iz-1}\sqrt{iz-1}\sqrt{-z}}{2\sqrt{z}\sqrt{z^2+1}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(i z)$

Involving $\operatorname{csch}^{-1}(i z)$ and $\sec^{-1}(z)$

01.29.27.1099.01

$$\operatorname{csch}^{-1}(i z) = i\left(\sec^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\sec^{-1}\left(\sqrt{-z}\right)$

01.29.27.1100.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = i \sec^{-1}\left(\sqrt{-z}\right) - \frac{\pi i}{2} /; 0 < \arg(z) \leq \pi$$

01.29.27.1101.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1102.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\sqrt{-z}}{\sqrt{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{-z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.29.27.1103.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.1104.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi i}{2} /; -\pi < \arg(z) \leq 0$$

01.29.27.1105.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{-z^2}}{z} \left(\sec^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.29.27.1106.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - i \sec^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.29.27.1107.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sec^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.29.27.1108.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{-\frac{1}{z}}\ \sqrt{z}\left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{-\frac{1}{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\sec^{-1}(i\,z)$

01.29.27.1109.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{\pi\,i}{2} - i\sec^{-1}(i\,z)\ /;\ -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1110.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = i\sec^{-1}(i\,z) - \frac{\pi\,i}{2}\ /;\ \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1111.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{i\sqrt{z^2}}{z}\left(\frac{\pi}{2} - \sec^{-1}(i\,z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$ and $\sec^{-1}(z)$

01.29.27.1112.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \frac{\pi\,i}{2} - i\sec^{-1}(z)\ /;\ 0 < \arg(z) \leq \pi$$

01.29.27.1113.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = i\sec^{-1}(z) - \frac{\pi\,i}{2}\ /;\ -\pi < \arg(z) \leq 0$$

01.29.27.1114.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \frac{\sqrt{-z^2}}{z}\left(\sec^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\operatorname{csch}^{-1}(a\,(b\,z^c)^m)$ and $\sec^{-1}(i\,a\,b^m\,z^{m\,c})$

01.29.27.1115.01

$$\operatorname{csch}^{-1}(a\,(b\,z^c)^m) = \frac{i\,(b\,z^c)^m}{b^m\,z^{m\,c}}\left(\frac{\pi}{2} - \sec^{-1}(i\,a\,b^m\,z^{m\,c})\right)/;\ 2\,m \in \mathbb{Z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1116.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.1117.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1118.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\sqrt{1-z}}{\sqrt{z-1}} \sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1119.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.1120.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1121.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi i /; (z \in \mathbb{R} \wedge z < 0)$$

01.29.27.1122.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \left(\sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right)\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1123.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1124.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i \sec^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) \leq 0$$

01.29.27.1125.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\sqrt{1-z} \sqrt{\frac{1}{z-1}} \sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1126.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1127.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1128.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = i \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1129.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{1-z} \sqrt{\frac{1}{z-1}} \left(\sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right)\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1130.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{i}{2}\left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1131.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{i}{2}\left(-\sec^{-1}\left(\frac{1}{z}\right) + \pi\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.1132.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1133.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1134.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1135.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}}\sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2c}{z+a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1136.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{i}{2}\left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right) /;\ \operatorname{Im}(z) \ge 0$$

01.29.27.1137.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{i}{2}\left(-\sec^{-1}\left(\frac{1}{z}\right) + \pi\right) /;\ \operatorname{Im}(z) < 0$$

01.29.27.1138.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{\sqrt{1+z}}{2}\sqrt{\frac{1}{-1-z}}\left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right)$$

01.29.27.1139.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2}{z+1}}\right) = \frac{\sqrt{z}}{2}\sqrt{-\frac{1}{z}}\left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1140.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /;\ \operatorname{Im}(z) \le 0$$

01.29.27.1141.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1142.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{\sqrt{1-z}}{2}\sqrt{\frac{1}{z-1}}\sec^{-1}\left(\frac{1}{z}\right)$$

01.29.27.1143.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{\sqrt{-z}}{2}\sqrt{\frac{1}{z}}\sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.29.27.1144.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -i\sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1145.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1146.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = i\left(\sec^{-1}\left(\sqrt{z}\right) - \pi\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1147.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\left(\frac{\pi}{2} - \sqrt{z}\sqrt{\frac{1}{z}}\left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{z}\right)\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.29.27.1148.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1149.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -i\sec^{-1}\left(\sqrt{z}\right) /; -\pi < \arg(z) \le 0$$

01.29.27.1150.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = i\left(-\sec^{-1}\left(\sqrt{z}\right)+\pi\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1151.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \frac{\pi}{2}\left(\sqrt{-z}\sqrt{\frac{1}{z}} - \frac{\sqrt{-z}}{\sqrt{z}}\right) - \sqrt{-z}\sqrt{\frac{1}{z}}\sec^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\sec^{-1}\left(\sqrt{z}\right)$

01.29.27.1152.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -i\sec^{-1}\left(\sqrt{z}\right) /; 0 \le \arg(z) < \pi$$

01.29.27.1153.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\sec^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1154.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = i\left(\sec^{-1}\left(\sqrt{z}\right)-\pi\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1155.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{1}{1-z}}\sqrt{z-1}\left(\sqrt{z}\sqrt{\frac{1}{z}}\left(\frac{\pi}{2}-\sec^{-1}\left(\sqrt{z}\right)\right)-\frac{\pi}{2}\right)$$

01.29.27.1156.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = z\sqrt{-\frac{1}{z^2}}\left(\frac{\pi}{2}-\sec^{-1}\left(\sqrt{z}\right)\right)-\frac{\pi}{2}\sqrt{-\frac{1}{z}}\sqrt{z}$$

01.29.27.1157.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{1}{1-z}}\sqrt{z-1}\left(\sqrt{z}\sqrt{\frac{1}{z}}\left(\frac{\pi}{2}-\sec^{-1}\left(\sqrt{z}\right)\right)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right)$ and $\sec^{-1}(z)$

01.29.27.1158.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi i}{2} /; 0 < \arg(z) \le \pi$$

01.29.27.1159.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = -\frac{i}{2}\sec^{-1}(z) + \frac{\pi\,i}{2} \;/;\; -\pi < \arg(z) \leq 0$$

01.29.27.1160.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = -\frac{\sqrt{-z}}{2\sqrt{z}}\sec^{-1}(z) - \frac{\pi\,z}{2\sqrt{-z^2}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}(z)$

01.29.27.1161.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\,i\sec^{-1}(z) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1162.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{1}{2}\,i\sec^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0018.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{2\sqrt{z-1}}\sec^{-1}(z)$$

01.29.27.1163.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}\,\sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\sec^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right)$ and $\sec^{-1}(z)$

01.29.27.1164.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = -\frac{i}{2}\sec^{-1}(z) + \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1165.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > -1)$$

01.29.27.1166.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z-1}}{2\sqrt{z+1}}\left(\sec^{-1}(z) - \pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}(z)$

01.29.27.1167.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = \frac{1}{2}\,i\sec^{-1}(z)\;/;\;0<\arg(z)\leq\pi$$

01.29.27.1168.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = -\frac{1}{2}\,i\sec^{-1}(z)\;/;\;-\pi<\arg(z)\leq 0$$

01.29.27.1169.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z}}{2\sqrt{-z}}\sec^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right)$ and $\sec^{-1}(z)$

01.29.27.1170.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right) = -\frac{i}{2}\sec^{-1}(z)+\frac{\pi\,i}{2}\;/;\;\operatorname{Im}(z)>0$$

01.29.27.1171.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right) = \frac{i}{2}\sec^{-1}(z)-\frac{\pi\,i}{2}\;/;\;\operatorname{Im}(z)\leq 0$$

01.29.27.1172.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right) = \frac{1}{2}\sqrt{-z}\,\sqrt{\frac{1}{z}}\left(\sec^{-1}(z)-\pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right)$ and $\sec^{-1}(z)$

01.29.27.1173.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = -\frac{1}{2}\,i\sec^{-1}(z)\;/;\;\operatorname{Im}(z)\geq 0$$

01.29.27.1174.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = \frac{1}{2}\,i\sec^{-1}(z)\;/;\;\operatorname{Im}(z)<0$$

01.29.27.1175.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = -\frac{\sqrt{z}}{2}\sqrt{-\frac{1}{z}}\sec^{-1}(z)$$

01.29.27.1176.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\frac{1}{2}\sqrt{z-1}\sqrt{\frac{1}{1-z}}\sec^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1177.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = i\sec^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1178.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -i\sec^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1179.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -i\pi + i\sec^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1180.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = i\pi - i\sec^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1181.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1182.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\sec^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.1183.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -i\sec^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.1184.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -i\,\pi + i\sec^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.1185.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = i\,\pi - i\sec^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1186.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \sqrt{1-z^2}\,\sqrt{\frac{1}{z^2-1}}\left(\frac{\sqrt{z^2}}{z}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.29.27.1187.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -i\sec^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1188.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = i\sec^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1189.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\pi\, i + i\sec^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1190.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \pi\, i - i\sec^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1191.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi\sqrt{-z^2}}{2\, z} - \sqrt{\frac{1}{z^2}}\,\sqrt{-z^2}\left(\frac{\pi}{2} - \sec^{-1}(z)\right) /; z \notin (-1,\, 1)$$

01.29.27.1192.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2}\sqrt{1-z^2}}{z\sqrt{z^2-1}}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.29.27.1193.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -i\sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.29.27.1194.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = i\sec^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1195.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \pi\,i - i\sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1196.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\pi\,i + i\sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0) \bigvee (i\,z \in \mathbb{R} \land i\,z < 0)$$

01.29.27.1197.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\sqrt{1-z^2}}{\sqrt{z^2-1}}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.29.27.1198.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = i\sec^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.29.27.1199.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -i \sec^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.1200.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\pi\, i + i \sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1201.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \pi\, i - i \sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.1202.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\sqrt{-z^2}}{\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\; z \left(\frac{\pi}{2} - \sec^{-1}(z)\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.29.27.1203.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -i \sec^{-1}(z) \;/;\; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.1204.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = i \sec^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1205.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \pi\, i - i \sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1206.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\pi\, i + i \sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0) \bigvee (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.1207.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\sqrt{-\frac{1}{z^2}}\,\sqrt{z^2}\left(\frac{\pi}{2} - z\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2} - \sec^{-1}(z)\right)\right)$$

01.29.27.1208.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\frac{1}{2}\sqrt{\frac{1}{1-z}}\,\sqrt{\frac{1}{z+1}}\,\sqrt{z^2-1}\left(2\sqrt{\frac{1}{z^2}}\,\sec^{-1}(z)\,z - \pi\sqrt{\frac{1}{z^2}}\,z + \pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1209.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right) = \frac{2z^2}{\sqrt{-z^4}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.1210.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right) = \frac{\pi\sqrt{1-2z^2}\,\sqrt{z^4-z^2}}{2\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2z^2-1}}$$
$$\left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{\sqrt{2}\,z+1}}\,\sqrt{\sqrt{2}\,z+1} + \sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-\sqrt{2}\,z}}\,\sqrt{1-\sqrt{2}\,z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right) -$$
$$\frac{2\sqrt{1-2z^2}\,\sqrt{z^4-z^2}}{\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2z^2-1}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.29.27.1211.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\left(\frac{\pi}{2} - \sec^{-1}(z)\right) /; |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.1212.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}\left(\pi\left(\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{\frac{1}{z}}\sqrt{z}+\frac{\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}\,z^3}{1-z^2}+\sqrt{\frac{z}{z-\sqrt{2}}}\sqrt{\frac{z-\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}-2\right)+4\sec^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1213.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4} \;/;\; 0<\arg(z)\leq\pi$$

01.29.27.1214.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4}-\frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi<\arg(z)\leq 0$$

01.29.27.1215.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1216.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = -\frac{\pi i}{4} + \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1) \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1217.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{i}{2}\sec^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1218.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = -\frac{z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1219.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1220.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.1221.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2 z^2}}{z \sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^4}}{2 z^2}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2 z^2 / \left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2 z^2 / \left(\sqrt{1-z^2}-1\right)}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.29.27.1222.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2 z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4} \;/;\; 0<\arg(z)\leq\frac{\pi}{2} \bigvee -\pi<\arg(z)\leq-\frac{\pi}{2} \bigvee (z\in\mathbb{R}\land -1<z<1)$$

01.29.27.1223.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2 z^2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4}-\frac{1}{2} i \sec^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2}<\arg(z)<\pi \bigvee -\frac{\pi}{2}<\arg(z)<0 \bigvee (z\in\mathbb{R}\land z>1) \bigvee (z\in\mathbb{R}\land z<-1)$$

01.29.27.1224.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2 z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{\sqrt{-1+z^2}}{2\sqrt{1-z^2}}\left(\frac{\pi}{2}-\sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2 z} / \sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2 z} / \sqrt{\sqrt{z^2-1}-z}\right)$ and $\sec^{-1}(z)$

01.29.27.1225.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4}-\frac{1}{2} i \sec^{-1}(z) \;/;\; 0\leq\arg(z)\leq\frac{\pi}{2}$$

01.29.27.1226.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1227.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1228.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1229.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1230.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1 - \frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{z}\left(\frac{\pi}{2} - \sec^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\sec^{-1}(z)$

01.29.27.1231.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1232.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{i}{2}\sec^{-1}(z) - \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1233.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1234.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2} i \sec^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1235.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2} i \sec^{-1}(z) \;/;\; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1236.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) =$$

$$\frac{\pi}{4}\left(\frac{\sqrt{-z}\sqrt{z^2}}{z^{3/2}} - \frac{\sqrt{-z^2}}{z} + 2 i \sqrt{z}\sqrt{\frac{1}{z}} - 2i\right) + \frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{1-z}\sqrt{-\frac{1}{z^2}}\sqrt{\frac{i}{z}}\, z \sqrt{-i z}\left(\frac{\pi}{2} - \sec^{-1}(z)\right)$$

Involving $\sinh^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.0019.01

$$\operatorname{csch}^{-1}(z) = \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(i \frac{2+z^2}{z^2}\right)$

01.29.27.1237.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{i(z^2+2)}{z^2}\right) \;/;\; 0 \le \arg(z) < \pi$$

01.29.27.1238.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{i(z^2+2)}{z^2}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1239.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\sqrt{-\frac{1}{z^2}}\, z \left(i \sinh^{-1}\left(\frac{i(z^2+2)}{z^2}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right)$

01.29.27.1240.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) /; \operatorname{Im}(z) \geq 1 \vee \operatorname{Re}(z) > 0 \wedge \operatorname{Im}(z) > 0$$

01.29.27.1241.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right) /; \operatorname{Im}(z) \leq 0 \vee \operatorname{Re}(z) \leq 0 \wedge \operatorname{Im}(z) < 1$$

01.29.27.1242.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\sqrt{z-i}\sqrt{\frac{1}{1+iz}}\sqrt{-\frac{i}{z}}\sqrt{-z}\,\sinh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right)$

01.29.27.1243.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) \geq 0 \wedge \operatorname{Im}(z) > 1 \vee \operatorname{Re}(z) \leq 0 \wedge \operatorname{Im}(z) \geq 0$$

01.29.27.1244.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) > 0 \wedge \operatorname{Im}(z) \leq 1 \vee \operatorname{Im}(z) < 0$$

01.29.27.1245.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\sqrt{\frac{1}{iz+1}}\sqrt{-\frac{i}{z}}\sqrt{z}\sqrt{i-z}\,\sinh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right)$

01.29.27.1246.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz < -1)$$

01.29.27.1247.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right) /; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.29.27.1248.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2z\sqrt{\frac{1}{z^2}}\sqrt{1+iz}\sqrt{\frac{1}{1+iz}}\,\sinh^{-1}\left(\sqrt{\frac{i-z}{2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{2z}}\right)$

01.29.27.1249.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\sinh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{2z}}\right) /; \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > -1$$

01.29.27.1250.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\sinh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{2z}}\right) /; \operatorname{Im}(z) \leq -1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < 0$$

01.29.27.1251.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\sqrt{-i-z}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\sqrt{z}\sinh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{-2z}}\right)$

01.29.27.1252.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\sinh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{-2z}}\right) /; \operatorname{Im}(z) \geq -1 \land \operatorname{Re}(z) < 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 0$$

01.29.27.1253.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\sinh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{-2z}}\right) /; \operatorname{Im}(z) < -1 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) \leq 0$$

01.29.27.1254.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\sqrt{-z}\sqrt{i+z}\sinh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{-2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{-\frac{z+i}{2z}}\right)$

01.29.27.1255.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\sinh^{-1}\left(\sqrt{-\frac{z+i}{2z}}\right) /; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.1256.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\sinh^{-1}\left(\sqrt{-\frac{z+i}{2z}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (iz \in \mathbb{R} \land iz > 1)$$

01.29.27.1257.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2z\sqrt{\frac{1}{z^2}}\sqrt{1-iz}\sqrt{\frac{1}{1-iz}}\sinh^{-1}\left(\sqrt{-\frac{z+i}{2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z^2}}\right)$

01.29.27.1258.01

$$\operatorname{csch}^{-1}(z) = \sinh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1259.01

$$\operatorname{csch}^{-1}(z) = -\sinh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1260.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z^2}}{z} \sinh^{-1}\left(\frac{1}{\sqrt{z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z^2}}\right)$

01.29.27.1261.01

$$\operatorname{csch}^{-1}(z) = \sinh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.1262.01

$$\operatorname{csch}^{-1}(z) = -\sinh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1263.01

$$\operatorname{csch}^{-1}(z) = z \sqrt{\frac{1}{z^2}} \sinh^{-1}\left(\sqrt{\frac{1}{z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)$

01.29.27.1264.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1265.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1266.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1267.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1268.01

$$\operatorname{csch}^{-1}(z) = -\sqrt{-\frac{1}{z^2}} \left(\frac{\pi z}{2} + \sqrt{-z^2} \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right)$

01.29.27.1269.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1270.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1271.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.27.1272.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1273.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z}\sqrt{z^2}}{\sqrt{-z}} \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{z^2}}\right) - \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right)$

01.29.27.1274.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1275.01

$$\operatorname{csch}^{-1}(z) == \frac{\pi i}{2} + \sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1276.01

$$\operatorname{csch}^{-1}(z) == -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0) \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.27.1277.01

$$\operatorname{csch}^{-1}(z) == \frac{\pi i}{2} - \sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1278.01

$$\operatorname{csch}^{-1}(z) == -z \sqrt{-\frac{1}{z^2}} \left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2-1}} \sinh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{-z^2}}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right)$

01.29.27.1279.01

$$\operatorname{csch}^{-1}(z) == -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1280.01

$$\operatorname{csch}^{-1}(z) == \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1281.01

$$\operatorname{csch}^{-1}(z) == -\frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1282.01

$$\operatorname{csch}^{-1}(z) == \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1283.01

$$\operatorname{csch}^{-1}(z) == \frac{\sqrt{z} \sqrt{-z^2-1}}{\sqrt{-z} \sqrt{z^2+1}} \sinh^{-1}\left(\sqrt{-\frac{z^2+1}{z^2}}\right) - \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\sinh^{-1}\left(\frac{2\sqrt{1+z^2}}{z^2}\right)$

01.29.27.1284.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) /; \operatorname{Re}(z) > 0 \bigwedge |z| \geq \sqrt{2}$$

01.29.27.1285.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right) /; \operatorname{Re}(z) < 0 \bigwedge |z| \geq \sqrt{2}$$

01.29.27.1286.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(-\sqrt{-\frac{1}{z^2}}\, z + i\sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}+z}{z}}\sqrt{-i z}\sqrt{\frac{z}{i\sqrt{2}+z}} - i\sqrt{-\frac{i}{z}}\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{i z}\sqrt{\frac{z}{z-i\sqrt{2}}} - \frac{z\sqrt{\frac{z^2+1}{z^4}}}{\sqrt{-\frac{z^2+1}{z^2}}}\right) - \frac{\sqrt{-z}\, z^{3/2}}{2\sqrt{\frac{1}{z^4}+\frac{1}{z^2}}\sqrt{-z^2-2}\sqrt{1-\frac{1}{z^2+2}}}\sqrt{-\frac{1}{z^4}}\sqrt{-\frac{(z^2+1)^2}{z^4}}\sinh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1287.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1288.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.29.27.1289.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1290.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sqrt{z}\,\sqrt{\frac{1}{z}}\,\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(\sqrt{z}\right)$

01.29.27.1291.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}\left(1\Big/\sqrt{\frac{1}{z}}\right)$

01.29.27.1292.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sinh^{-1}\left(1\Big/\sqrt{\frac{1}{z}}\right) /;\ |\arg(z)| < \pi$$

01.29.27.1293.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\sinh^{-1}\left(1\Big/\sqrt{\frac{1}{z}}\right) /;\ (z \in \mathbb{R} \land z < 0)$$

01.29.27.1294.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z}\,\sqrt{\frac{1}{z}}\,\sinh^{-1}\left(1\Big/\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1295.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \sinh^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.27.1296.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -\sinh^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.27.1297.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{\sqrt{z^2}}{z}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(a\,(b\,z^c)^m\right)$

Involving $\operatorname{csch}^{-1}(a\,(b\,z^c)^m)$ and $\sinh^{-1}\left(\frac{1}{a}\,b^{-m}\,z^{-m\,c}\right)$

01.29.27.1298.01

$$\operatorname{csch}^{-1}(a\,(b\,z^c)^m) = \frac{(b\,z^c)^m}{b^m\,z^{m\,c}}\,\sinh^{-1}\left(\frac{1}{a}\,b^{-m}\,z^{-m\,c}\right) /;\ 2\,m \in \mathbb{Z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\sinh^{-1}\left(i\,\sqrt{z}\right)$

01.29.27.1299.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\pi\,i}{2} - \sinh^{-1}\left(i\,\sqrt{z}\right) /;\ 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1300.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = -\frac{\pi\,i}{2} + \sinh^{-1}\left(i\,\sqrt{z}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1301.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(i\,\sinh^{-1}\left(i\,\sqrt{z}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z}}\right)$ and $\sinh^{-1}\left(\sqrt{z}\right)$

01.29.27.1302.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z}}\right) = \frac{\pi\,i}{2} + \sinh^{-1}\left(\sqrt{z}\right) /;\ -\pi < \arg(z) \leq 0$$

01.29.27.1303.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z}}\right) = -\frac{\pi\,i}{2} + \sinh^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1304.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z}}\right) = \frac{\pi\,i}{2} - \sinh^{-1}\left(\sqrt{z}\right) /;\ (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1305.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z}}\right) = \sqrt{\frac{z}{z+1}}\,\sqrt{\frac{z+1}{z}}\left(\sinh^{-1}\left(\sqrt{z}\right) + \frac{\pi\,\sqrt{-z^2}}{2\,z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\sinh^{-1}(i\sqrt{z})$

01.29.27.1306.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2} - \sinh^{-1}(i\sqrt{z}) \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1307.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(i\sqrt{z}) \;/;\; \operatorname{Im}(z) \le 0$$

01.29.27.1308.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\sqrt{1-z}\,\sqrt{\frac{1}{z-1}}\left(i\sinh^{-1}(i\sqrt{z}) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.29.27.1309.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = \frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.1310.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(\sqrt{z}) \;/;\; 0 < \arg(z) \le \pi$$

01.29.27.1311.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(\sqrt{z}) \;/;\; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1312.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-z-1}}\right) = \frac{\sqrt{-z\,(1+z)}}{\sqrt{z}}\sqrt{-\frac{1}{1+z}}\left(\sinh^{-1}(\sqrt{z}) + \frac{\pi\sqrt{-z^2}}{2\,z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right)$ and $\sinh^{-1}(i\,z)$

01.29.27.1313.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}(i z) \;/;\; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1314.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}(i z) \;/;\; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1315.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-z-1}}\right) = -\frac{\sqrt{z+1}}{2\sqrt{-z-1}}\left(\frac{\pi}{2} - i\sinh^{-1}(i z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\sinh^{-1}(i z)$

01.29.27.1316.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}(i z) \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1317.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}(i z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1318.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = -\frac{\sqrt{1-z}}{2\sqrt{z-1}}\left(i\sinh^{-1}(i z) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{c z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right)$ and $\sinh^{-1}(i z)$

01.29.27.1319.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}(i z) \;/;\; \operatorname{Im}(z) \geq 0$$

01.29.27.1320.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}(i z) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.1321.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z+1}}\sqrt{z+1}\left(\frac{\pi}{2} - i\sinh^{-1}(i z)\right)$$

01.29.27.1322.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\left(\frac{\pi}{2} - i\sinh^{-1}(i\,z)\right)$$

01.29.27.1323.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2}{z+1}}\right) = -\frac{\sqrt{z}}{2}\sqrt{-\frac{1}{z}}\left(\frac{\pi}{2} - i\sinh^{-1}(i\,z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\sinh^{-1}(i\,z)$

01.29.27.1324.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\pi\,i}{4} - \frac{1}{2}\sinh^{-1}(i\,z)\;/;\;\operatorname{Im}(z) > 0$$

01.29.27.1325.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{\pi\,i}{4} + \frac{1}{2}\sinh^{-1}(i\,z)\;/;\;\operatorname{Im}(z) \le 0$$

01.29.27.1326.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z}}\sqrt{-z}\left(i\sinh^{-1}(i\,z) + \frac{\pi}{2}\right)$$

01.29.27.1327.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{1}{2}\sqrt{1-z}\sqrt{\frac{1}{-1+z}}\left(i\sinh^{-1}(i\,z) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1328.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi\,i}{2}\;/;\;0 < \arg(z) \le \pi$$

01.29.27.1329.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = -\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\,i}{2}\;/;\;\operatorname{Im}(z) < 0$$

01.29.27.1330.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\,i}{2}\;/;\;(z \in \mathbb{R} \land z > 0)$$

01.29.27.1331.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{-\frac{1}{z}}\sqrt{-z}\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1332.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} /; 0 < \arg(z) < \pi$$

01.29.27.1333.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = -\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0$$

01.29.27.1334.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1335.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi i}{2} /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1336.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{-z-1}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \sqrt{-\frac{1}{z^2}}\sqrt{-z^2}\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1337.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1338.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1339.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > -1)$$

01.29.27.1340.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}} - \frac{\sqrt{z}}{\sqrt{-z-1}}\sqrt{-\frac{z+1}{z}}\,\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1341.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0$$

01.29.27.1342.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1343.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1344.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1345.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z+1}}\right) = \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}} - \frac{1}{\sqrt{-z-1}\sqrt{\frac{1}{z}}}\sqrt{\frac{-z-1}{z}}\,\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1346.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.29.27.1347.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1348.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) = 0$$

01.29.27.1349.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \sqrt{-\frac{1}{z^2}}\, \sqrt{-z^2}\, \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{1}{2}\pi\sqrt{-z}\, \sqrt{\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1350.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1351.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1352.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1353.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{-z-1}}\right) = \sqrt{-\frac{1}{z}}\, \sqrt{-z}\, \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{1}{2}\pi\sqrt{-z}\, \sqrt{\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1354.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > -1$$

01.29.27.1355.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) \leq -1 \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1356.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-i-z}}\right) =$$

$$\frac{i\pi\sqrt{z}}{4\sqrt{-i-z}}\sqrt{-\frac{i+z}{z}}\left(-\sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{1-iz}}\, \sqrt{1-iz} + 1\right) + \frac{1}{2}\sqrt{-i-z}\, \sqrt{\frac{i}{z}}\, \sqrt{z}\, \sqrt{\frac{1}{1-iz}}\, \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1357.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1$$

01.29.27.1358.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 1 \bigvee \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.29.27.1359.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{i-z}}\right) = \frac{i\pi\sqrt{2z}}{4\sqrt{i-z}}\sqrt{\frac{i-z}{2z}}\left(\sqrt{\frac{1}{z^2}}\, z - \sqrt{\frac{1}{iz+1}}\sqrt{iz+1} + 1\right) + \frac{1}{2}\sqrt{i-z}\sqrt{-\frac{i}{z}}\sqrt{z}\sqrt{\frac{1}{iz+1}}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1360.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi$$

01.29.27.1361.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; -\pi < \arg(z) \leq 0$$

01.29.27.1362.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{\sqrt{-z^2}}{4z}\left(\pi - 2i\sinh^{-1}\left(\frac{i}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1363.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1364.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1365.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{-\frac{1}{z}}\sqrt{(1-z)z}\left(i\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1366.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i+z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1$$

01.29.27.1367.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i+z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < -1 \bigvee -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.29.27.1368.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{i+z}}\right) = \frac{i\pi\sqrt{-2z}}{4\sqrt{i+z}}\sqrt{-\frac{i+z}{2z}}\left(1-\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\right)-\frac{1}{2}\sqrt{i+z}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\sqrt{-z}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-i}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1369.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-i}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) \leq 0 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < 1$$

01.29.27.1370.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-i}}\right) = \frac{\pi i}{4} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) \geq 1 \bigvee 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.1371.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-i}}\right) = \frac{i\pi\sqrt{-z}}{4\sqrt{z-i}}\sqrt{\frac{i-z}{z}}\left(\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{iz+1}}\sqrt{iz+1}+1\right)-\frac{1}{2}\sqrt{z-i}\sqrt{\frac{1}{iz+1}}\sqrt{-\frac{i}{z}}\sqrt{-z}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1372.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1373.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; -\pi < \arg(z) \leq 0 \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1374.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z-1}}{4\sqrt{z+1}}\left(2\,i\sinh^{-1}\left(\frac{i}{z}\right)-\pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1375.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)-\frac{\pi\,i}{4}\;/;\;-\pi<\arg(z)\leq 0$$

01.29.27.1376.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi\,i}{4}\;/;\;0<\arg(z)\leq \pi$$

01.29.27.1377.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-1}}\right) = -\frac{\sqrt{-z^2}}{z}\left(\frac{1}{2}\,i\sinh^{-1}\left(\frac{i}{z}\right)+\frac{\pi}{4}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{i+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1378.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2\,z}{i+z}}\right) = -\frac{\pi\,i}{4}+\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;\operatorname{Re}(z)\geq 0$$

01.29.27.1379.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2\,z}{i+z}}\right) = \frac{\pi\,i}{4}-\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;\operatorname{Re}(z)<0$$

01.29.27.1380.01

$$\operatorname{csch}^{-1}\left(\sqrt{-\frac{2\,z}{i+z}}\right) = -\frac{i\sqrt{i\,z}}{2}\sqrt{\frac{i}{z}}\sinh^{-1}\left(\frac{1}{z}\right)-\frac{1}{4}\pi\sqrt{\frac{i}{z}}\sqrt{i\,z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{i-z}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1381.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{i-z}}\right) = \frac{\pi\,i}{4}+\frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;\operatorname{Re}(z)>0$$

01.29.27.1382.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{i-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) \leq 0$$

01.29.27.1383.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{i-z}}\right) = \frac{1}{2} i \sqrt{-\frac{i}{z}} \sqrt{-iz} \left(\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1384.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{4} /; \operatorname{Im}(z) > 0$$

01.29.27.1385.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) \leq 0$$

01.29.27.1386.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \sqrt{-z} \sqrt{\frac{1}{z}} \left(\frac{1}{2} i \sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{4}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1387.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{4} /; \operatorname{Im}(z) \geq 0$$

01.29.27.1388.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\sinh^{-1}\left(\frac{i}{z}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1389.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\sqrt{z} \sqrt{-\frac{1}{z}} \left(\frac{1}{2} i \sinh^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{4}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right)$ and $\sinh^{-1}(z)$

01.29.27.1390.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.1391.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.1392.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.29.27.1393.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.1394.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \frac{\sqrt{-z^2-1}}{\sqrt{z^2+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \sinh^{-1}(z)\right)$$

01.29.27.1395.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-1-z^2}}\right) = \sqrt{\frac{-i z-1}{1-i z}} \sqrt{\frac{1-i z}{-i z-1}} \left(\frac{\sqrt{z^2}}{z} \sinh^{-1}(z) + \frac{\pi \sqrt{-z^4}}{2 z^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right)$ and $\sinh^{-1}(z)$

01.29.27.1396.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.29.27.1397.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1398.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1399.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}(z) \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.27.1400.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{-1-z^2}}\right) = \sqrt{-\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\sqrt{-z^2}}{z} \sinh^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1401.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1402.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.1403.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1404.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1405.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{-1-z^2}}\right) = \frac{\pi \sqrt{-z^2}}{2 z} - \sqrt{-\frac{1}{z^2}} \sqrt{-z^2} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1406.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1407.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.29.27.1408.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z > 0)$$

01.29.27.1409.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1410.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{-z^2-1}}\right) = \frac{\pi \sqrt{-z^2}}{2\sqrt{z^2}} - \frac{z\sqrt{-z^2}}{\sqrt{z^2}} \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1411.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.1412.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z < 0) \bigvee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.1413.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z > 0) \bigvee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.29.27.1414.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.1415.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2+1}}\right) = \frac{\pi\sqrt{z^2+1}}{2\sqrt{-z^2-1}} - \frac{z\sqrt{z^2+1}}{\sqrt{-z^2-1}}\sqrt{-\frac{1}{z^2}}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1416.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.1417.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} + \sinh^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} \le \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1418.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = -\frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.27.1419.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = \frac{\pi i}{2} - \sinh^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1420.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{-z^2-1}}\right) = z\sqrt{-z^2}\sqrt{-\frac{1}{z^4}}\sinh^{-1}\left(\frac{1}{z}\right) - \frac{1}{2}\pi\sqrt{\frac{1}{z^2}}\sqrt{-z^2}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{1+z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{1+z^2}}\right)$ and $\sinh^{-1}(z)$

01.29.27.1421.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{1+z^2}}\right) = 2\sinh^{-1}(z) /;\ |\arg(z)| \le \frac{\pi}{4} \bigvee -\pi < \arg(z) \le -\frac{3\pi}{4} \bigvee \frac{3\pi}{4} \le \arg(z) \le \pi$$

01.29.27.1422.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2\,z\,\sqrt{1+z^2}}\right) = -\frac{\pi\sqrt{2\,z^2+1}\,\sqrt{z^4+z^2}}{2\sqrt{z^2}\,\sqrt{-2\,z^2-1}\,\sqrt{-z^2-1}}\left(\frac{\sqrt{-z^2}}{z}+i\sqrt{\frac{i}{z}}\,\sqrt{-i\,z}\,\sqrt{\frac{1}{1-i\sqrt{2}\,z}}\,\sqrt{1-i\sqrt{2}\,z}-i\sqrt{-\frac{i}{z}}\,\sqrt{i\,z}\,\sqrt{\frac{1}{\sqrt{2}\,i\,z+1}}\,\sqrt{\sqrt{2}\,i\,z+1}+\frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}}\right)-\frac{2\sqrt{2\,z^2+1}\,\sqrt{z^4+z^2}}{\sqrt{z^2}\,\sqrt{-2\,z^2-1}\,\sqrt{-z^2-1}}\sinh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{z^2+1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{z^2+1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1423.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{z^2+1}}\right) = 2\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;|z|\geq\sqrt{2}\bigwedge -\frac{\pi}{2}<\arg(z)\leq\frac{\pi}{2}$$

01.29.27.1424.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{z^2+1}}\right) = -2\sinh^{-1}\left(\frac{1}{z}\right)\;/;\;|z|\geq\sqrt{2}\bigwedge\left(\frac{\pi}{2}<\arg(z)\leq\pi\bigvee -\pi<\arg(z)\leq-\frac{\pi}{2}\right)$$

01.29.27.1425.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{z^2+1}}\right) = \frac{\sqrt{-z^2-2}\,\sqrt{z^2+1}}{2\sqrt{1-i\,z}\,(-i+z)\left(-\frac{i}{z}\right)^{5/2}\sqrt{-(z^2+1)(z^2+2)}}\sqrt{\frac{i-z}{z}}\,\sqrt{\frac{z^2+1}{z^4}}\left(\pi\left(\sqrt{-\frac{1}{z^2}}\,z-\frac{z^3}{z^2+1}\sqrt{\frac{z^2+1}{z^4}}\,\sqrt{-\frac{z^2+1}{z^2}}+i\sqrt{\frac{-i\sqrt{2}+z}{z}}\,\sqrt{-\frac{i}{z}}\,\sqrt{i\,z}\,\sqrt{\frac{z}{-i\sqrt{2}+z}}-i\sqrt{-i\,z}\,\sqrt{\frac{i}{z}}\,\sqrt{\frac{z+i\sqrt{2}}{z}}\,\sqrt{\frac{z}{i\sqrt{2}+z}}\right)+4\sinh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\middle/\sqrt{\sqrt{1+z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\middle/\sqrt{\sqrt{1+z^2}-1}\right)$ and $\sinh^{-1}(z)$

01.29.27.1426.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{1}{2}\sinh^{-1}(z) \,/;\, -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1427.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1+z^2}-1}}\right) = -\frac{1}{2}\sinh^{-1}(z) \,/;\, \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1428.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{\sqrt{z^2}}{2z}\sinh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1+z^2}-1\right)}\right)$ and $\sinh^{-1}(z)$

01.29.27.1429.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1+z^2}-1}}\right) = \frac{1}{2}\sinh^{-1}(z) \,/;\, \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1430.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1+z^2}-1}}\right) = -\frac{1}{2}\sinh^{-1}(z) \,/;\, \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1431.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1+z^2}-1}}\right) = \frac{z}{2}\sqrt{\frac{1}{z^2}}\sqrt{z^2+1}\sqrt{\frac{1}{z^2+1}}\sinh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1+z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2 z^2} \Big/ \left(z \sqrt{\sqrt{1+z^2} - 1}\right)\right)$ and $\sinh^{-1}(z)$

01.29.27.1432.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2 z^2}}{z \sqrt{\sqrt{1+z^2} - 1}}\right) = \frac{1}{2} \sinh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z} \sqrt{2 z^2 \Big/ \left(\sqrt{1+z^2} - 1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z} \sqrt{2 z^2 \Big/ \left(\sqrt{1+z^2} - 1\right)}\right)$ and $\sinh^{-1}(z)$

01.29.27.1433.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z} \sqrt{\frac{2 z^2}{\sqrt{1+z^2} - 1}}\right) = \frac{1}{2} \sinh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2 z} \Big/ \sqrt{\sqrt{z^2+1} - z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2 z} \Big/ \sqrt{\sqrt{z^2+1} - z}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1434.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{\sqrt{z^2+1} - z}}\right) = \frac{1}{2} \sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1435.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2 z}}{\sqrt{\sqrt{z^2+1} - z}}\right) = -\frac{\pi i}{2} - \frac{1}{2} \sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1436.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = -\frac{\pi i}{2} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1437.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{\pi i}{2} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1438.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{4\sqrt{z}}\left(\sqrt{\frac{1}{z^2}}\,(-z)^{3/2} + \sqrt{-z} - i\sqrt{z}\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)\right) + \frac{\sqrt{-i z-1}\,\sqrt{i z-1}}{2\sqrt{z}}\sqrt{\frac{1}{z}}\,\sqrt{\frac{z^2}{z^2+1}}\,\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z \big/ \left(\sqrt{z^2+1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z \big/ \left(\sqrt{z^2+1}-z\right)}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1439.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1440.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = -\frac{\pi i}{2} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1441.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{\pi i}{2} - \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1442.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = -\frac{\pi i}{2} + \frac{1}{2}\sinh^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1443.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2+1}-z}}\right) = \frac{\pi i}{4}\left(\frac{i\sqrt{-z}\left(\sqrt{z^2}-z\right)}{z^{3/2}} + 2\sqrt{\frac{1}{1-iz}}\sqrt{1-iz} + \sqrt{\frac{z^2+1}{z^2}}\sqrt{\frac{z^2}{z^2+1}} - 3\right) + \frac{i\sqrt{-iz-1}\sqrt{-iz}\sqrt{z}}{2\sqrt{iz+1}}\sqrt{\frac{1}{z}}\sqrt{\frac{i}{z}}\sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\cosh^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1444.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1445.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1446.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{1}{\sqrt{\frac{i}{z}-1}}\sqrt{1-\frac{i}{z}}\cosh^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(-\frac{i}{z}\right)$

01.29.27.1447.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(-\frac{i}{z}\right) + \frac{\pi i}{2} /; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1448.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(-\frac{i}{z}\right) + \frac{\pi i}{2} /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1449.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{\pi}{2} - \frac{1}{\sqrt{-\frac{i}{z}-1}}\sqrt{1+\frac{i}{z}}\cosh^{-1}\left(-\frac{i}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(1+\frac{2}{z^2}\right)$

01.29.27.1450.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\cosh^{-1}\left(\frac{2}{z^2}+1\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.1451.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\cosh^{-1}\left(\frac{2}{z^2}+1\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1452.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\, z \cosh^{-1}\left(1+\frac{2}{z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right)$

01.29.27.1453.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1454.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) \leq -1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1455.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.1456.01

$$\operatorname{csch}^{-1}(z) = \pi i\left(\frac{1}{2} - \frac{\sqrt{-z}}{\sqrt{-i-z}}\sqrt{\frac{i+z}{z}}\right) + \frac{2\, z}{\sqrt{1+i z}}\sqrt{\frac{1+i z}{z^2}}\, \cosh^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{-2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right)$

01.29.27.1457.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; -\frac{\pi}{2} \leq \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1458.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < -1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1459.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2z}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.1460.01

$$\operatorname{csch}^{-1}(z) = \pi\, i\left(\frac{1}{2} - \frac{\sqrt{z}}{\sqrt{i+z}}\sqrt{\frac{i+z}{z}}\right) + \frac{2\, z}{\sqrt{1+i\, z}}\sqrt{\frac{1+i\, z}{z^2}}\cosh^{-1}\left(\frac{\sqrt{z+i}}{\sqrt{2\, z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{z+i}{2\, z}}\right)$

01.29.27.1461.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\, i}{2} + 2\cosh^{-1}\left(\sqrt{\frac{z+i}{2\, z}}\right) /;\ -\frac{\pi}{2} \leq \arg(z) < -\frac{\pi}{2} \bigvee (i\, z \in \mathbb{R} \land i\, z < -1)$$

01.29.27.1462.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\, i}{2} - 2\cosh^{-1}\left(\sqrt{\frac{z+i}{2\, z}}\right) /;\ \operatorname{Re}(z) < 0 \lor (i\, z \in \mathbb{R} \land -1 < i\, z < 0)$$

01.29.27.1463.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\, i}{2} + \frac{2\, z}{\sqrt{1+i\, z}}\sqrt{\frac{1+i\, z}{z^2}}\cosh^{-1}\left(\sqrt{\frac{z+i}{2\, z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\, z}}\right)$

01.29.27.1464.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\, i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\, z}}\right) /;\ \operatorname{Re}(z) > 0 \lor (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.1465.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\, i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\, z}}\right) /;\ \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) > 1 \lor (i\, z \in \mathbb{R} \land i\, z > 1)$$

01.29.27.1466.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\, \pi\, i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\, z}}\right) /;\ \operatorname{Re}(z) \leq 0 \land 0 \leq \operatorname{Im}(z) < 1$$

01.29.27.1467.01

$$\operatorname{csch}^{-1}(z) = i\, \pi\left(\frac{\sqrt{z}}{\sqrt{-i+z}}\sqrt{\frac{-i+z}{z}} - \frac{1}{2}\right) + \frac{2\, z}{\sqrt{1-i\, z}}\sqrt{\frac{1-i\, z}{z^2}}\cosh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{2\, z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2\, z}}\right)$

01.29.27.1468.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\, i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2\, z}}\right) /;\ \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 0 \lor (i\, z \in \mathbb{R} \land 0 < i\, z < 1)$$

01.29.27.1469.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\cosh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1470.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} + 2\cosh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right) /; \operatorname{Re}(z) > 0 \land 0 < \operatorname{Im}(z) \leq 1$$

01.29.27.1471.01

$$\operatorname{csch}^{-1}(z) = i\pi\left(\frac{\sqrt{-z}}{\sqrt{i-z}}\sqrt{\frac{-i+z}{z}} - \frac{1}{2}\right) + \frac{2z}{\sqrt{1-iz}}\sqrt{\frac{1-iz}{z^2}}\cosh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{-2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{z-i}{2z}}\right)$

01.29.27.1472.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\cosh^{-1}\left(\sqrt{\frac{z-i}{2z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1473.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\cosh^{-1}\left(\sqrt{\frac{z-i}{2z}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1474.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \frac{2z}{\sqrt{1-iz}}\sqrt{\frac{1-iz}{z^2}}\cosh^{-1}\left(\sqrt{\frac{z-i}{2z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$

01.29.27.1475.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1476.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1477.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1478.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1479.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z}\ \sqrt{-z^2-1}}{\sqrt{-z}\ \sqrt{z^2+1}} \cosh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$

01.29.27.1480.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1481.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1482.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1483.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1484.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z}\ \sqrt{-z^2-1}}{\sqrt{-z}\ \sqrt{z^2+1}} \cosh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right) - \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{1+z^2}}{z}\right)$

01.29.27.1485.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(\frac{\sqrt{1+z^2}}{z}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1486.01

$$\operatorname{csch}^{-1}(z) = -\pi i - \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1487.01

$$\operatorname{csch}^{-1}(z) = \pi i - \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1488.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) /; \ (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1489.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\sqrt{\frac{1}{z}} \sqrt{-z} - \sqrt{\frac{1}{z^2}} z \sqrt{\frac{1}{z}} \sqrt{-z} - i \sqrt{z^2+1} \sqrt{\frac{1}{z^2+1}} + i\right) + z \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{1-i z}} \sqrt{1-i z} \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{z^2}}\right)$

01.29.27.1490.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1491.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(\frac{\sqrt{1+z^2}}{\sqrt{z^2}}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1492.01

$$\operatorname{csch}^{-1}(z) = -\pi i - \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1493.01

$$\operatorname{csch}^{-1}(z) = \pi i + \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1494.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2}\left(\sqrt{\frac{z-i}{z}} \sqrt{\frac{z}{z-i}} - \sqrt{\frac{z+i}{z}} \sqrt{\frac{z}{z+i}}\right) + z \sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$$

01.29.27.1495.01

$$\operatorname{csch}^{-1}(z) = z \sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) - \frac{\pi i z}{2} \sqrt{\frac{1}{z^2}} \left(\frac{\sqrt{z^2} \sqrt{-1-z^2}}{\sqrt{-z^2 \left(1+z^2\right)}} - 1\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right)$

01.29.27.1496.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.1497.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1498.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{\sqrt{-1-z^2}}{\sqrt{-z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{1+z^2}{z^2}}\right)$

01.29.27.1499.01

$$\operatorname{csch}^{-1}(z) = \cosh^{-1}\left(\sqrt{\frac{1+z^2}{z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.1500.01

$$\operatorname{csch}^{-1}(z) = -\cosh^{-1}\left(\sqrt{\frac{1+z^2}{z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1501.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\sqrt{\frac{1+z^2}{z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\cosh^{-1}\left(-\frac{2\sqrt{-1-z^2}}{z^2}\right)$

01.29.27.1502.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z^2}}{2z} \cosh^{-1}\left(-\frac{2\sqrt{-z^2-1}}{z^2}\right) + \frac{\pi\sqrt{-z^2}}{4z} /; z \notin (-\infty, 1)$$

01.29.27.1503.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4}\sqrt{\frac{z^2+2}{z^2}}\sqrt{\frac{z^2}{z^2+2}}\left(\frac{i z}{\sqrt{-z^2}} - \sqrt{1-\frac{i\sqrt{2}}{z}}\sqrt{\frac{i z}{i z+\sqrt{2}}} + \sqrt{1+\frac{i\sqrt{2}}{z}}\sqrt{-\frac{i z}{\sqrt{2}-i z}}\right) + \frac{z\sqrt{-z^2-2}}{2\sqrt{-z^2\left(z^2+2\right)}}\cosh^{-1}\left(-\frac{2\sqrt{-z^2-1}}{z^2}\right)$$

01.29.27.1504.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4}\left(i\sqrt{-\frac{1}{z^2}}\,z + \frac{i z}{\sqrt{-\frac{z^2+1}{z^2}}}\sqrt{\frac{z^2+1}{z^4}} + \sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}+z}{z}}\sqrt{-i z}\sqrt{\frac{i z}{i z-\sqrt{2}}} - \sqrt{-\frac{i}{z}}\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{i z}\sqrt{\frac{i z}{i z+\sqrt{2}}}\right) + \frac{z}{2\sqrt{\frac{z^2+2}{z^2}}\sqrt{-z^2-1}\sqrt{\frac{z^2+1}{z^4}}}\sqrt{\frac{1}{z^2}}\sqrt{-\frac{z^2+2}{z^2}}\sqrt{-\frac{\left(z^2+1\right)^2}{z^4}}\left(\frac{\pi}{2} - \frac{1}{\sqrt{-\frac{2\sqrt{-z^2-1}}{z^2}-1}}\sqrt{\frac{2\sqrt{-z^2-1}}{z^2}+1}\,\cosh^{-1}\left(-\frac{2\sqrt{-z^2-1}}{z^2}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.29.27.1505.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1506.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1507.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} - \cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1508.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}}\cosh^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.29.27.1509.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1510.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1511.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1512.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \cosh^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{1}{2}\pi \sqrt{-\frac{1}{z}} \sqrt{z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(\sqrt{-z}\right)$

01.29.27.1513.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1514.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \cosh^{-1}\left(\sqrt{-z}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.1515.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - \cosh^{-1}\left(\sqrt{-z}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1516.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \cosh^{-1}\left(\sqrt{-z}\right) - \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{c\, z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\cosh^{-1}\left(\frac{i}{z}\right)$

01.29.27.1517.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \cosh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1518.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \cosh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Re}(z) < 0$$

01.29.27.1519.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -\cosh^{-1}\left(\frac{i}{z}\right) + \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1520.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -\cosh^{-1}\left(\frac{i}{z}\right) - \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1521.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \sqrt{-i z - 1} \sqrt{\frac{i}{-i + z}} \cosh^{-1}\left(\frac{i}{z}\right) - \frac{i \pi \sqrt{z^2}}{2 z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1522.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1523.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1524.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1525.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1526.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \sqrt{z - 1} \sqrt{\frac{1}{z - 1}} \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\cosh^{-1}\left(1 + \frac{2}{z^2}\right)$

01.29.27.1527.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{1}{2} \sqrt{\frac{1}{z^2}} \sqrt{z^2} \cosh^{-1}\left(1 + \frac{2}{z^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{z}\right)$

01.29.27.0020.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \cosh^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{1-z}\right)$

01.29.27.1528.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\frac{\sqrt{-z^2}}{z}\cosh^{-1}\left(\sqrt{1-z}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{z}\right)$

01.29.27.1529.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \cosh^{-1}\left(\sqrt{z}\right) /; z \notin (-\infty, 1)$$

01.29.27.1530.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\cosh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.29.27.1531.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{z-1}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1532.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1533.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1534.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = -\frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land -1 < z < 1)$$

01.29.27.1535.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{\sqrt{z+1}\,\sqrt{1-z}}{2\sqrt{-z-1}\,\sqrt{z-1}}\cosh^{-1}(z) - \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1536.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{1}{2}\cosh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1537.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{2} \;/;\; 0 < \arg(z) \le \pi \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1538.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.1539.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = -\frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1540.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z}}\,\sqrt{z}\left(\frac{\sqrt{z-1}}{\sqrt{1-z}}\cosh^{-1}(z) + \pi\right)$$

01.29.27.1541.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{\sqrt{1-z^2}}{2\sqrt{z-1}}\sqrt{-\frac{1}{z+1}}\cosh^{-1}(z) - \frac{1}{2}\pi\sqrt{-\frac{1}{z+1}}\sqrt{z+1}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1542.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{1}{2}\cosh^{-1}(z) \;/;\; z \notin (-\infty, 1)$$

01.29.27.1543.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{1}{2}\cosh^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 1)$$

01.29.27.1544.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\cosh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1545.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; |\arg(z)| < \pi$$

01.29.27.1546.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi\, i \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1547.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \frac{\pi\, i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}} - 1\right) + \sqrt{\frac{1}{z}}\sqrt{z}\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1548.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) \;/;\; |\arg(z)| < \pi$$

01.29.27.1549.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1550.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \sqrt{z}\sqrt{\frac{1}{z}}\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1551.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 1)$$

01.29.27.1552.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1553.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1554.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\sqrt{z-1}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1555.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (-\infty, 1)$$

01.29.27.1556.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.29.27.1557.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\sqrt{z-1}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1558.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 0) \land z \notin (1, \infty)$$

01.29.27.1559.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1560.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\pi i - \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1561.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{z}{1-z}} \sqrt{\frac{1-z}{z}} \left(\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2}\left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1562.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (-\infty, 0) \land z \notin (1, \infty)$$

01.29.27.1563.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1564.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \sqrt{\frac{z}{1-z}} \sqrt{\frac{1-z}{z}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1565.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0$$

01.29.27.1566.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} \;/;\; (i\,m(z) \in \mathbb{R} \land i\,m(z) < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1567.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1568.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1569.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = \frac{\pi\sqrt{-z^2}}{2\,z} - \frac{1}{2}\sqrt{z-1}\,\sqrt{\frac{1}{z-1}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1570.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; |\arg(z)| < \pi$$

01.29.27.1571.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1572.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{1-z}}\right) = \frac{1}{2}\sqrt{z}\,\sqrt{\frac{1}{z}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z-a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1573.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1574.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{z+1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1575.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1576.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1577.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z-1}\,\sqrt{z-1}\,\sqrt{z}}{2\sqrt{1-z^2}}\sqrt{\frac{1}{z}}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1578.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; z \notin (-\infty, 1)$$

01.29.27.1579.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z < 1)$$

01.29.27.1580.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1581.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.1582.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1583.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1584.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{-z-1}}\right) = \frac{1}{2}\sqrt{\frac{z}{z-1}}\,\sqrt{\frac{z-1}{z}}\,\cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z}}{2}\,\sqrt{\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1585.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right)\;/;\; z \notin (-\infty, 0) \bigwedge z \notin (1, \infty)$$

01.29.27.1586.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = -\frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right)\;/;\; (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1587.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\,z}{1-z}}\right) = \frac{1}{2}\sqrt{\frac{1-z}{z}}\,\sqrt{\frac{z}{1-z}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1588.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z)\;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1589.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) - \pi\,i\;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1590.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) + \pi\,i\;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1591.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\cosh^{-1}(z) + \pi\,i\;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0022.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) /; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) > 0$$

01.29.27.0023.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \cosh^{-1}(z) + \frac{\pi i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) + 2 i \pi /; \operatorname{Im}(z) < 0 \land \operatorname{Re}(z) \leq 0$$

01.29.27.1592.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi \sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{\sqrt{z-1}\, z \sqrt{z+1}}{\sqrt{z^2}\sqrt{z^2-1}} \cosh^{-1}(z)$$

01.29.27.1593.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi \sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{z}{\sqrt{z-1}\sqrt{z+1}} \sqrt{\frac{z^2-1}{z^2}} \cosh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1594.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1595.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \cosh^{-1}(z) - \pi i /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1596.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \cosh^{-1}(z) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1597.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\cosh^{-1}(z) /; (i z \in \mathbb{R} \land i z < 0) \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1598.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\cosh^{-1}(z) - \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.1599.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi}{2}\sqrt{1-z^2}\,\sqrt{\frac{1}{z^2-1}}\left(\frac{\sqrt{z^2}}{z}-1\right) + \frac{\sqrt{z-1}\, z\sqrt{z+1}}{\sqrt{z^2}}\sqrt{\frac{1}{z^2-1}}\,\cosh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1600.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} \le \arg(z) < \frac{\pi}{2}$$

01.29.27.1601.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; \frac{\pi}{2} \le \arg(z) < \pi$$

01.29.27.1602.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1603.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1604.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi\sqrt{z^2-z^4}}{2\, z\sqrt{z^2-1}}\left(1-\sqrt{\frac{1}{z^2}}\, z\right) + \sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\, z\sqrt{\frac{1}{z^2}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1605.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0$$

01.29.27.1606.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1607.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1608.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1609.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(1-\sqrt{\frac{1}{z^2}}\, z\right) + \sqrt{\frac{z+1}{1-z}}\,(1-z)\sqrt{\frac{1}{z^2}}\sqrt{\frac{z^2}{1-z^2}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1610.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1611.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land 0 < z < 1) \lor (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.1612.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1613.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1614.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.1615.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1616.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi\sqrt{-z^2}}{2\sqrt{z^2}}\left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + \frac{\sqrt{1-z}\,\sqrt{-z}\,\sqrt{z^2}}{\sqrt{z-1}}\sqrt{\frac{1}{z}}\,\sqrt{\frac{1}{z^2}}\,\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1617.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1618.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1619.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1620.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z > 1) \lor (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.1621.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\cosh^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.1622.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi\sqrt{-1+z^2}}{2}\sqrt{\frac{1}{1-z^2}}\left(\sqrt{\frac{1}{z^2}}\,z-1\right)+\sqrt{\frac{1}{1-z}}\sqrt{1-z}\sqrt{z^2}\sqrt{\frac{1}{z^2}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right)$ and $\cosh^{-1}(z)$

01.29.27.1623.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right) = \frac{2z^2}{\sqrt{-z^4}}\left(\frac{\pi}{2}-\frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)/;\ \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.1624.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2z\sqrt{z^2-1}}\right) = \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\left(\frac{\sqrt{z^2}}{z}-\sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}\,z+1}}\sqrt{\sqrt{2}\,z+1}+\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}\,z}}\sqrt{1-\sqrt{2}\,z}+\frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}\right)-\frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{1-z^2}\sqrt{2z^2-1}}\left(\frac{\pi}{2}-\frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1625.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = -\frac{2z\sqrt{z^2-1}}{\sqrt{z^2-z^4}}\left(\frac{\pi}{2}-\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right)/;\ |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.29.27.1626.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) = \frac{z}{2\sqrt{-\frac{1}{z^2}}\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{z^2-2}$$

$$\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}+\sqrt{\frac{1}{z^2}}\,z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\right.\right.$$

$$\left.\left.\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}-2\right)+4\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\Big/\sqrt{\sqrt{1-z^2}-1}\right)$ and $\cosh^{-1}(z)$

01.29.27.1627.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\cosh^{-1}(z)-\frac{\pi i}{4} /; 0<\arg(z)\leq\pi$$

01.29.27.1628.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4}+\frac{1}{2}\cosh^{-1}(z) /; \operatorname{Im}(z)<0\lor(z\in\mathbb{R}\land z>1)$$

01.29.27.1629.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4}-\frac{1}{2}\cosh^{-1}(z) /; (z\in\mathbb{R}\land 0<z<1)$$

01.29.27.1630.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\cosh^{-1}(z)$

01.29.27.1631.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1) \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1632.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}(z) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1633.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}(z) \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1634.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}\left(\frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2}\Big/\left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$ and $\cosh^{-1}(z)$

01.29.27.1635.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1636.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1637.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}(z) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.1638.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2 \Big/ \left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2 \Big/ \left(\sqrt{1-z^2}-1\right)}\right)$ and $\cosh^{-1}(z)$

01.29.27.1639.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.29.27.1640.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{4} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1641.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\cosh^{-1}(z) + \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.29.27.1642.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\cosh^{-1}(z) - \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1643.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{z^2-1}}{2\sqrt{z-1}\sqrt{z+1}}\cosh^{-1}(z) - \frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z}\Big/\sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z}\Big/\sqrt{\sqrt{z^2-1}-z}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1644.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1645.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.1646.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1647.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1648.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1649.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1650.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1-\frac{i\sqrt{-i z}}{\sqrt{i z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{z}\left(\frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\cosh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\big/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\big/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1651.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1652.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1653.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1654.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1655.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\cosh^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.1656.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) =$$

$$\frac{\pi}{4}\left(3 i \sqrt{\frac{1}{z}} \sqrt{z} + \frac{2z}{\sqrt{-z^2}} + \frac{\sqrt{-z^4}}{z^2} - i\left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} + \sqrt{\frac{i}{z}} \sqrt{-i z} + 1\right)\right) + \frac{1}{2}\sqrt{-i z} \sqrt{\frac{i}{z}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\tanh^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{1+z^2}\right)$

01.29.27.1657.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{1+z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1658.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{z^2+1}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1659.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{1+z^2}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1660.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{1+z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1661.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z}\left(\frac{\pi}{2} - \frac{\sqrt{-\left(z^2+1\right)^2}}{z^2+1} \tanh^{-1}\left(\sqrt{z^2+1}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$

01.29.27.1662.01

$$\operatorname{csch}^{-1}(z) = \tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1663.01

$$\operatorname{csch}^{-1}(z) = -\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1664.01

$$\operatorname{csch}^{-1}(z) = \pi i + \tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1665.01

$$\operatorname{csch}^{-1}(z) = -\pi i - \tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1666.01

$$\operatorname{csch}^{-1}(z) = \sqrt{\frac{i+z}{i-z}} \sqrt{\frac{i-z}{i+z}} \left(z \sqrt{\frac{1}{z^2}} \tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) - \frac{i \pi \sqrt{-z^2}}{2 z} \left(\frac{\sqrt{-i z-1}}{\sqrt{i z+1}} + \frac{\sqrt{i z-1}}{\sqrt{1-i z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)$

01.29.27.1667.01

$$\operatorname{csch}^{-1}(z) = \tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1668.01

$$\operatorname{csch}^{-1}(z) = -\tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1669.01

$$\operatorname{csch}^{-1}(z) = \pi i + \tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1670.01

$$\operatorname{csch}^{-1}(z) = -\pi i - \tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1671.01

$$\operatorname{csch}^{-1}(z) = z \sqrt{\frac{1}{z^2}} \tanh^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) + \left(\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}} \sqrt{\frac{z+i}{z}}\right) \frac{\pi i}{2}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right)$

01.29.27.1672.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right)/;\ 0 < |\arg(z)| \leq \frac{\pi}{4} \bigvee |z| \geq \sqrt{2} \bigwedge \operatorname{Re}(z) > 0$$

01.29.27.1673.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{z^2+2}\right)/;\ |z| \geq \sqrt{2} \bigwedge \operatorname{Re}(z) < 0$$

01.29.27.1674.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(-\sqrt{-\frac{1}{z^2}}\ z + i\sqrt{-\frac{i}{z}}\sqrt{-\frac{i\sqrt{2}+z}{z}}\sqrt{i z}\sqrt{\frac{i z}{\sqrt{2}-i z}} - i\sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}-z}{z}}\sqrt{-i z}\sqrt{-\frac{i z}{\sqrt{2}+i z}} + \frac{\sqrt{-\frac{z^2+1}{z^2}}}{z\sqrt{\frac{z^2+1}{z^4}}}\right) - \frac{\sqrt{-z^2}\sqrt{z^2+1}}{2 z\sqrt{-z^2-1}}\tanh^{-1}\left(\frac{2\sqrt{z^2+1}}{-z^2-2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right)$

01.29.27.1675.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)/;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1676.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)/;\ -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.1677.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)/;\ \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1678.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)/;\ -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1679.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)/;\ (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1680.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1681.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z} + i\sqrt{\frac{z}{-i+z}}\sqrt{\frac{-i+z}{z}} - i\sqrt{\frac{z}{i+z}}\sqrt{\frac{i+z}{z}}\right) + \frac{\sqrt{z}\sqrt{-z^2-1}}{2\sqrt{-z}\sqrt{z^2+1}}\tanh^{-1}\left(\frac{z^2+2}{2\sqrt{z^2+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right)$

01.29.27.1682.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1683.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1684.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1685.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + 2 i\sqrt{\frac{1}{1-i z}}\sqrt{i z-1}\sqrt{\frac{i}{z}}\sqrt{-i z}\tanh^{-1}\left(\frac{\sqrt{-i z-1}}{\sqrt{i z-1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right)$

01.29.27.1686.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1687.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1688.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1689.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i\sqrt{-i z-1}\sqrt{1-i z}\sqrt{-i z}}{\sqrt{i z+1}}\sqrt{\frac{i}{z}}\sqrt{\frac{1}{1-i z}}\tanh^{-1}\left(\frac{\sqrt{i z+1}}{\sqrt{1-i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)$

01.29.27.1690.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > -1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) \geq 1$$

01.29.27.1691.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) \leq -1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < 1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1692.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1693.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i-z}\sqrt{-i z-1}\sqrt{-i z}}{\sqrt{-i+z}}\sqrt{\frac{1}{1-i z}}\sqrt{\frac{i}{z}}\tanh^{-1}\left(\frac{\sqrt{z-i}}{\sqrt{-z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$

01.29.27.1694.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1695.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < -1 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1696.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1697.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i z-1}\sqrt{-i z}\sqrt{i+z}}{\sqrt{i-z}}\sqrt{\frac{1}{1-i z}}\sqrt{\frac{i}{z}}\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$

01.29.27.1698.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1699.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1700.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1701.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i z - 1}\sqrt{-i z}}{\sqrt{i z + 1}}\sqrt{\frac{i}{z}}\tanh^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right)$

01.29.27.1702.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1703.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1704.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1705.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - 2 i \sqrt{\frac{1}{i z + 1}}\sqrt{-i z - 1}\sqrt{-\frac{i}{z}}\sqrt{i z}\tanh^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right)$

01.29.27.1706.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1707.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1708.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1709.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z + 1}\sqrt{i z}}{\sqrt{1 - i z}}\sqrt{-\frac{i}{z}}\sqrt{\frac{1}{i z + 1}}\tanh^{-1}\left(\frac{\sqrt{1 - i z}}{\sqrt{i z + 1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$

01.29.27.1710.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1711.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < -1$$

01.29.27.1712.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1713.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i z - 1}\sqrt{-i z}\sqrt{i + z}}{\sqrt{i - z}}\sqrt{\frac{1}{1 - i z}}\sqrt{\frac{i}{z}}\tanh^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$

01.29.27.1714.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1$$

01.29.27.1715.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < -1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1716.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1717.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z}\sqrt{i - z}}{\sqrt{i + z}}\sqrt{\frac{1}{i z + 1}}\sqrt{-\frac{i}{z}}\tanh^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$

01.29.27.1718.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1719.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\tanh^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1720.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\tanh^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1721.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z}}{\sqrt{1 - i z}}\sqrt{-\frac{i}{z}}\tanh^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(z + \sqrt{1+z^2}\right)$

01.29.27.1722.01

$$\operatorname{csch}^{-1}(z) = -\pi i + 2\tanh^{-1}\left(z + \sqrt{z^2+1}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1723.01

$$\operatorname{csch}^{-1}(z) = \pi i + 2\tanh^{-1}\left(z + \sqrt{z^2+1}\right) /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1724.01

$$\operatorname{csch}^{-1}(z) = -2\tanh^{-1}\left(z + \sqrt{z^2+1}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1725.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\pi\left(i\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right) - \frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z + 1\right)\right) + \frac{2\sqrt{z}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\tanh^{-1}\left(z + \sqrt{z^2+1}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(-z + \sqrt{1+z^2}\right)$

01.29.27.1726.01

$$\operatorname{csch}^{-1}(z) = 2\tanh^{-1}\left(\sqrt{z^2+1} - z\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1727.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2\tanh^{-1}\left(\sqrt{z^2+1} - z\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1728.01

$$\operatorname{csch}^{-1}(z) = \pi i - 2\tanh^{-1}\left(\sqrt{z^2+1} - z\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1729.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z-1\right)-i\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1}\,-1\right)\right)+\frac{2\sqrt{z}\,\sqrt{-z^2-1}}{\sqrt{-z}\,\sqrt{z^2+1}}\tanh^{-1}\left(\sqrt{z^2+1}\,-z\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{1}{z+\sqrt{z^2+1}}\right)$

01.29.27.1730.01

$$\operatorname{csch}^{-1}(z) = 2\tanh^{-1}\left(\frac{1}{z+\sqrt{z^2+1}}\right)\; /;\; \operatorname{Re}(z)>0 \lor (i\,z\in\mathbb{R}\land i\,z<-1)\lor(i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.29.27.1731.01

$$\operatorname{csch}^{-1}(z) = -\pi\,i-2\tanh^{-1}\left(\frac{1}{z+\sqrt{z^2+1}}\right)\; /;\; \frac{\pi}{2}<\arg(z)\le\pi \bigvee (i\,z\in\mathbb{R}\land -1<i\,z<0)$$

01.29.27.1732.01

$$\operatorname{csch}^{-1}(z) = \pi\,i-2\tanh^{-1}\left(\frac{1}{z+\sqrt{z^2+1}}\right)\; /;\; -\pi<\arg(z)<-\frac{\pi}{2} \bigvee (i\,z\in\mathbb{R}\land i\,z>1)$$

01.29.27.1733.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z-1\right)-i\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1}\,-1\right)\right)+\frac{2\sqrt{z}\,\sqrt{-z^2-1}}{\sqrt{-z}\,\sqrt{z^2+1}}\tanh^{-1}\left(\frac{1}{z+\sqrt{z^2+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}\,-z}\right)$

01.29.27.1734.01

$$\operatorname{csch}^{-1}(z) = -\pi\,i+2\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}\,-z}\right)\; /;\; 0<\arg(z)<\frac{\pi}{2} \bigvee (i\,z\in\mathbb{R}\land i\,z<-1)$$

01.29.27.1735.01

$$\operatorname{csch}^{-1}(z) = \pi\,i+2\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}\,-z}\right)\; /;\; -\frac{\pi}{2}<\arg(z)\le 0 \bigvee (i\,z\in\mathbb{R}\land 0<i\,z<1)$$

01.29.27.1736.01

$$\operatorname{csch}^{-1}(z) = -2\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}\,-z}\right)\; /;\; \operatorname{Re}(z)<0 \lor (i\,z\in\mathbb{R}\land -1<i\,z<0)\lor(i\,z\in\mathbb{R}\land i\,z>1)$$

01.29.27.1737.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\pi\left(i\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1}\,-1\right)-\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z+1\right)\right)+\frac{2\sqrt{z}\,\sqrt{-z^2-1}}{\sqrt{-z}\,\sqrt{z^2+1}}\tanh^{-1}\left(\frac{1}{\sqrt{z^2+1}\,-z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tanh^{-1}(z)$

01.29.27.0024.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2\tanh^{-1}(z) \;/;\; |z| < 1$$

01.29.27.1738.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i - 2\tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.1739.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i - 2\tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.1740.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2\tanh^{-1}(z) - \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.29.27.1741.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\tanh^{-1}(z) - \frac{\pi\sqrt{-z^2}}{2z}\left(1 - \frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1742.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi i + 2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.1743.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi i + 2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.1744.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi\sqrt{-\frac{1}{z^2}}\, z + 2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1$$

01.29.27.1745.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1$$

01.29.27.1746.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{1}{2}\pi z \sqrt{-\frac{1}{z^2}} \left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) + \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\tanh^{-1}(z^r)$

01.29.27.1747.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2\, i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}} \tanh^{-1}\left(z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\tanh^{-1}(z)$

01.29.27.1748.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2\tanh^{-1}(z) \;/;\; |z| < 1$$

01.29.27.1749.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i + 2\tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \leq \pi$$

01.29.27.1750.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i + 2\tanh^{-1}(z) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.1751.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2\tanh^{-1}(z) + \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.29.27.1752.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2} \tanh^{-1}(z) + \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1753.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i - 2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.1754.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i - 2\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.1755.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2\,z}\right) = -\pi \sqrt{-\frac{1}{z^2}}\; z - 2\tanh^{-1}\left(\frac{1}{z}\right) /;\ |z| < 1$$

01.29.27.1756.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2\,z}\right) = 2\tanh^{-1}\left(\frac{1}{z}\right) /;\ |z| > 1$$

01.29.27.1757.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2\,z}\right) = -\frac{\pi\,z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-i\,z}{1+i\,z}\sqrt{\left(\frac{i\,z+1}{i\,z-1}\right)^2}+1\right) - \frac{2\,(1-i\,z)}{1+i\,z}\sqrt{\left(\frac{i\,z+1}{i\,z-1}\right)^2}\;\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2\,z}\right)$ and $\tanh^{-1}(z^r)$

01.29.27.1758.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2\,z}\right) = -2\,i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\;\tanh^{-1}\left(z^{\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.29.27.1759.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi\,i}{2} + \tanh^{-1}\left(\sqrt{z}\right) /;\ 0 < \arg(z) \le \pi$$

01.29.27.1760.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\pi\,i}{2} + \tanh^{-1}\left(\sqrt{z}\right) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1761.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi\,i}{2} - \tanh^{-1}\left(\sqrt{z}\right) /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1762.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\frac{\sqrt{-z}}{\sqrt{z}}\tanh^{-1}\left(\sqrt{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1763.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ z \notin (0,\ 1)$$

01.29.27.1764.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1765.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1766.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (-\infty, 1)$$

01.29.27.1767.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1768.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1769.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{-1+z}\,\sqrt{-z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2} \left(\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.29.27.1770.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; z \notin (1, \infty)$$

01.29.27.1771.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\tanh^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.0026.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{1-z} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2} \left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1772.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ 0 < \arg(z) \le \pi \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.1773.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ \operatorname{Im}(z) < 0$$

01.29.27.1774.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1775.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{\frac{1}{1-z}}\ \sqrt{1-z}\ \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1776.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.1777.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ \operatorname{Im}(z) < 0$$

01.29.27.1778.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.1779.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{z}\ \sqrt{\frac{1}{z}}\ \sqrt{\frac{1}{1-z}}\ \sqrt{1-z}\ \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.29.27.1780.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\tanh^{-1}\left(\sqrt{z}\right) /; z \notin (0, \infty)$$

01.29.27.1781.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1782.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1783.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\sqrt{z-1}\sqrt{z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\sqrt{z}\right) - \frac{\pi i}{2}\left(\sqrt{1-z}\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1784.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.1785.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1786.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1787.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\sqrt{z-1}}{\sqrt{-z}} \sqrt{\frac{z}{1-z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1788.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) < \pi$$

01.29.27.1789.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1790.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.1791.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1792.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\sqrt{-1+z}\,\sqrt{-z}\,\sqrt{\frac{1}{1-z}}\,\sqrt{\frac{1}{z}}\,\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\tanh^{-1}\left(\sqrt{z}\right)$

01.29.27.1793.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \tanh^{-1}\left(\sqrt{z}\right) /; z \notin (1, \infty) \bigwedge z \notin (-\infty, 0)$$

01.29.27.1794.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\tanh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.1795.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\pi i - \tanh^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.0025.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \tanh^{-1}\left(\sqrt{z}\right)\sqrt{\frac{z}{1-z}}\,\sqrt{\frac{1-z}{z}} + \frac{\pi i}{2}\left(\sqrt{1-z}\,\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1796.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1797.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.1798.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1799.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \sqrt{\frac{1-z}{z}} \sqrt{\frac{z}{1-z}} \left(\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{1}{2}\pi \sqrt{-\frac{1}{z}} \sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1800.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1801.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.1802.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1803.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi z}{2} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z^2}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$ and $\tanh^{-1}(z)$

01.29.27.1804.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\frac{\pi i}{2} + \tanh^{-1}(z) /; 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1805.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi i}{2} + \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1806.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi i}{2} - \tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1807.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\frac{\pi i}{2} - \tanh^{-1}(z) /; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0027.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{-z^2}\,\sqrt{z^2-1}}{z\sqrt{1-z^2}}\left(\tanh^{-1}(z)+\frac{\pi\sqrt{-z^2}}{2z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1808.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \tanh^{-1}\left(\frac{1}{z}\right)\ /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1809.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\tanh^{-1}\left(\frac{1}{z}\right)\ /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1810.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\tanh^{-1}\left(\frac{1}{z}\right) - \pi\, i\ /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1811.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \tanh^{-1}\left(\frac{1}{z}\right) - \pi\, i\ /;\ (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1812.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}}\left(\frac{\pi\, i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}}+\frac{\sqrt{z-1}}{\sqrt{1-z}}\right)+\frac{\sqrt{-z^2}}{z}\tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\tanh^{-1}(z)$

01.29.27.0028.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \tanh^{-1}(z)\ /;\ z \notin (-\infty, -1) \bigwedge z \notin (1, \infty)$$

01.29.27.1813.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\tanh^{-1}(z) - \pi\, i\ /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.27.1814.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\tanh^{-1}(z) + \pi\, i\ /;\ (z \in \mathbb{R} \land z < -1)$$

01.29.27.0029.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) + \sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2}\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1815.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1816.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1817.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1818.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1819.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{z+1}\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\sqrt{\frac{1}{1-z^2}}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\tanh^{-1}(z)$

01.29.27.1820.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1821.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1822.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi\, i + \tanh^{-1}(z) \,/;\, (z \in \mathbb{R} \land z < -1)$$

01.29.27.1823.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi\, i - \tanh^{-1}(z) \,/;\, (z \in \mathbb{R} \land z > 1)$$

01.29.27.1824.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\, i}{2}\left(\sqrt{\frac{1}{1-z}}\,\sqrt{1-z} + \sqrt{\frac{1}{z+1}}\,\sqrt{z+1} - 2\right) + \frac{z\sqrt{1-z^2}}{\sqrt{z^2}}\sqrt{\frac{1}{1-z^2}}\,\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1825.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\, i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /;\, 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1826.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi\, i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) /;\, -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1827.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi\, i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /;\, \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1828.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi\, i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /;\, -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1829.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi\, i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\tanh^{-1}(z)$

01.29.27.1830.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\tanh^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1831.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \tanh^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1832.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \tanh^{-1}(z) + \pi i \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1833.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\tanh^{-1}(z) + \pi i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1834.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2}\left(2 - \sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) - \frac{\sqrt{-z}\sqrt{z^2-1}}{\sqrt{z}}\sqrt{\frac{1}{1-z^2}}\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1835.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) \le \frac{\pi}{2}$$

01.29.27.1836.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.1837.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 0)$$

01.29.27.1838.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.27.1839.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = \frac{\sqrt{z}\sqrt{z^2-1}}{\sqrt{-z}}\sqrt{\frac{1}{1-z^2}}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^4}}{2z^2}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\tanh^{-1}(z)$

01.29.27.1840.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \tanh^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1841.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\tanh^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1842.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\tanh^{-1}(z) - \pi i \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.1843.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \tanh^{-1}(z) - \pi i \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1844.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \sqrt{\frac{1}{z^2}}\, z \left(\frac{1}{2} i \pi \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) + \tanh^{-1}(z) \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1845.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1846.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + \tanh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1847.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1848.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - \tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1849.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = z\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1}{1-z^2}}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{1}{2}\pi\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1}{1-z^2}}\sqrt{\frac{z^2}{1-z^2}}\sqrt{z^2-1}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4}\Big/\sqrt{1-\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4}\Big/\sqrt{1-\sqrt{1-z^2}}\right)$ and $\tanh^{-1}(z)$

01.29.27.1850.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1851.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.1852.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2\,z}\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4}\Big/\sqrt{1-\sqrt{1-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1853.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right)=\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.29.27.1854.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right)=\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z>1)$$

01.29.27.1855.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right)=-\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)-\frac{\pi i}{4}\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\land z<-1)$$

01.29.27.1856.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right)=-\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}\;/;\;-\pi<\arg(z)\leq-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land -1<z<0)$$

01.29.27.1857.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right)=\frac{\sqrt{z^2}}{2\,z}\tanh^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\sqrt{z^2}+\sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2}-1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4}\Big/\sqrt{z-\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4}\Big/\sqrt{z-\sqrt{z^2-1}}\right)$ and $\tanh^{-1}(z)$

01.29.27.1858.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right)=\frac{1}{2}\tanh^{-1}(z)-\frac{\pi i}{4}\;/;\;0<\arg(z)\leq\frac{\pi}{2}\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land -1<z<1)$$

01.29.27.1859.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) + \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1860.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) + \frac{3\pi i}{4} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1861.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) =$$

$$\frac{\pi}{4}\left(i\sqrt{z}\,\sqrt{\frac{1}{z}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}} - 2i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4} \Big/ \sqrt{z-\sqrt{z^2-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1862.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.27.1863.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1864.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1865.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right)+\frac{\pi i}{2} \;/;\; (z\in\mathbb{R}\land z<-1)$$

01.29.27.1866.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) =$$

$$\frac{1}{4}\pi\left(z\sqrt{-\frac{1}{z^2}}+\frac{\sqrt{-z^4}}{z^2}+i\sqrt{-z-1}\,\sqrt{-\frac{1}{z+1}}-i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right)+\frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2}\Big/\left(1-\sqrt{1-z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2}\Big/\left(1-\sqrt{1-z^2}\right)}\right)$ and $\tanh^{-1}(z)$

01.29.27.1867.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}(z) \;/;\; -\frac{\pi}{2}\le\arg(z)<\frac{\pi}{2}$$

01.29.27.1868.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}(z) \;/;\; \frac{\pi}{2}\le\arg(z)\le\pi\bigvee -\pi<\arg(z)<-\frac{\pi}{2}$$

01.29.27.1869.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{z}{2}\sqrt{\frac{1}{z^2}}\,\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2}\Big/\left(1-\sqrt{1-z^2}\right)}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1870.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1871.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1872.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.1873.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1874.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^4}}\,z^2 - \sqrt{\frac{1}{z^2}}\sqrt{z^2} + \sqrt{\frac{z^2}{1-z^2}}\sqrt{\frac{1}{z^2}-1}\right) + \frac{1}{2}\,z\sqrt{\frac{1}{z^2}}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1}\Big/\left(z-\sqrt{z^2-1}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1}\Big/\left(z-\sqrt{z^2-1}\right)}\right)$ and $\tanh^{-1}(z)$

01.29.27.1875.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i\,z \in \mathbb{R} \land i\,z > 0)$$

01.29.27.1876.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) + \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.1877.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) - \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1878.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}(z) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1879.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}(z) - \frac{3\pi i}{4} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.1880.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{\pi i}{4}\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{z+1}\sqrt{\frac{1}{z+1}}\left(i\sqrt{-\frac{1}{z^2}}\,z - \sqrt{-\frac{i}{z}}\sqrt{i z} - \sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2} + 2\right) - \frac{1}{2}i\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\tanh^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1}\Big/\left(z-\sqrt{z^2-1}\right)}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.29.27.1881.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1882.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.1883.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.1884.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land i z > 0) \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.1885.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{\pi}{4}\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{z+1}\sqrt{\frac{1}{z+1}}\left(-\sqrt{z}\sqrt{-\frac{1}{z}}-2\,i\sqrt{z}\sqrt{\frac{1}{z}}+2\,i+\frac{\sqrt{z^2}}{\sqrt{z}}\sqrt{-\frac{1}{z}}\right)-$$
$$\frac{1}{2}\,i\sqrt{\frac{i}{z}}\sqrt{i\,z}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\coth^{-1}$

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\sqrt{z^2+1}\right)$

01.29.27.1886.01

$$\operatorname{csch}^{-1}(z) = \coth^{-1}\left(\sqrt{z^2+1}\right) /;\ \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.1887.01

$$\operatorname{csch}^{-1}(z) = -\coth^{-1}\left(\sqrt{z^2+1}\right) /;\ \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.1888.01

$$\operatorname{csch}^{-1}(z) = \pi\,i + \coth^{-1}\left(\sqrt{z^2+1}\right) /;\ (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.1889.01

$$\operatorname{csch}^{-1}(z) = -\pi\,i - \coth^{-1}\left(\sqrt{z^2+1}\right) /;\ (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.1890.01

$$\operatorname{csch}^{-1}(z) = \sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}}\left(z\sqrt{\frac{1}{z^2}}\coth^{-1}\left(\sqrt{z^2+1}\right)-\frac{i\,\pi\sqrt{-z^2}}{2\,z}\left(\frac{\sqrt{-i\,z-1}}{\sqrt{i\,z+1}}+\frac{\sqrt{i\,z-1}}{\sqrt{1-i\,z}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$

01.29.27.1891.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2}+\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /;\ 0 < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.1892.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2}+\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /;\ -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.1893.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1894.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1895.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(\frac{\pi}{2} - \frac{\sqrt{-\left(z^2+1\right)^2}}{z^2+1} \coth^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$

01.29.27.1896.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.29.27.1897.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.29.27.1898.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.29.27.1899.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.1900.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{-z^2}}{z} \left(\frac{\pi}{2} - \sqrt{-z^2-1} \sqrt{\frac{1}{z^2+1}} \coth^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right)$

01.29.27.1901.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} + \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.1902.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} + \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.29.27.1903.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{4} - \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.1904.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4} - \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.1905.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{4} - \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.29.27.1906.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{4} + \frac{1}{2}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right) /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.1907.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(\frac{\sqrt{-z^2}}{z} + i\sqrt{\frac{z}{-i+z}}\sqrt{\frac{-i+z}{z}} - i\sqrt{\frac{z}{i+z}}\sqrt{\frac{i+z}{z}}\right) + \frac{\sqrt{z}\sqrt{-z^2-1}}{2\sqrt{-z}\sqrt{z^2+1}}\coth^{-1}\left(\frac{2\sqrt{1+z^2}}{2+z^2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right)$

01.29.27.1908.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\coth^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right) /; 0 < |\arg(z)| \leq \frac{\pi}{4} \bigvee |z| \geq \sqrt{2} \bigwedge \operatorname{Re}(z) > 0$$

01.29.27.1909.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\coth^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right) /; |z| \geq \sqrt{2} \bigwedge \operatorname{Re}(z) < 0$$

01.29.27.1910.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{4}\left(-\sqrt{-\frac{1}{z^2}}\, z + i\sqrt{-\frac{i}{z}}\sqrt{-\frac{i\sqrt{2}+z}{z}}\sqrt{i z}\sqrt{\frac{i z}{\sqrt{2}-i z}} - i\sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}-z}{z}}\sqrt{-i z}\sqrt{-\frac{i z}{\sqrt{2}+i z}} + \frac{\sqrt{-\frac{z^2+1}{z^2}}}{z\sqrt{\frac{z^2+1}{z^4}}}\right) - \frac{\sqrt{-z^2}\sqrt{z^2+1}}{2 z\sqrt{-z^2-1}}\coth^{-1}\left(\frac{2+z^2}{2\sqrt{1+z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right)$

01.29.27.1911.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z \le -1)$$

01.29.27.1912.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.27.1913.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1914.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - 2 i\sqrt{\frac{1}{i z+1}}\sqrt{-i z-1}\sqrt{-\frac{i}{z}}\sqrt{i z}\coth^{-1}\left(\frac{\sqrt{-1-i z}}{\sqrt{-1+i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right)$

01.29.27.1915.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1916.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1917.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{1+i z}}{\sqrt{1-i z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1918.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z + 1}\sqrt{i z}}{\sqrt{1 - i z}}\sqrt{-\frac{i}{z}}\sqrt{\frac{1}{i z + 1}}\coth^{-1}\left(\frac{\sqrt{1 + i z}}{\sqrt{1 - i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$

01.29.27.1919.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1920.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1 \lor \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < -1$$

01.29.27.1921.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1922.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i z - 1}\sqrt{-i z}\sqrt{i + z}}{\sqrt{i - z}}\sqrt{\frac{1}{1 - i z}}\sqrt{\frac{i}{z}}\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$

01.29.27.1923.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq -1 \lor \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) > 1$$

01.29.27.1924.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) < -1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \leq 1 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1925.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right) /; (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1926.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z}\sqrt{i - z}}{\sqrt{i + z}}\sqrt{\frac{1}{i z + 1}}\sqrt{-\frac{i}{z}}\coth^{-1}\left(\frac{\sqrt{i-z}}{\sqrt{i+z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$

01.29.27.1927.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; \operatorname{Re}(z) < 0$$

01.29.27.1928.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.1929.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right) /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.29.27.1930.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi i - \frac{2 i \sqrt{i z - 1}\sqrt{i z}\sqrt{z^2+1}}{\sqrt{1 - i z}}\sqrt{-\frac{i}{z}}\sqrt{\frac{1}{z^2+1}}\coth^{-1}\left(\sqrt{\frac{i-z}{i+z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right)$

01.29.27.1931.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.1932.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.1933.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right) /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.29.27.1934.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + 2 i \sqrt{\frac{1}{1-i z}}\sqrt{i z - 1}\sqrt{\frac{i}{z}}\sqrt{-i z}\coth^{-1}\left(\frac{\sqrt{-1+i z}}{\sqrt{-1-i z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right)$

01.29.27.1935.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.29.27.1936.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{1-i z}}{\sqrt{1+i z}}\right) /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge -1 < i z < 0) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.29.27.1937.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{1-iz}}{\sqrt{1+iz}}\right) /; (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.1938.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2i\sqrt{-iz-1}\sqrt{1-iz}\sqrt{-iz}}{\sqrt{iz+1}}\sqrt{\frac{i}{z}}\sqrt{\frac{1}{1-iz}}\coth^{-1}\left(\frac{\sqrt{1-iz}}{\sqrt{1+iz}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right)$

01.29.27.1939.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > -1 \lor \operatorname{Re}(z) \le 0 \land \operatorname{Im}(z) \ge 1$$

01.29.27.1940.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) \ge 0 \land \operatorname{Im}(z) \le -1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < 1 \lor (iz \in \mathbb{R} \land -1 < iz < 0)$$

01.29.27.1941.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right) /; (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.1942.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2i\sqrt{-i-z}\sqrt{-iz-1}\sqrt{-iz}}{\sqrt{-i+z}}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\coth^{-1}\left(\frac{\sqrt{-z-i}}{\sqrt{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$

01.29.27.1943.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) \ge 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \ge -1 \lor (iz \in \mathbb{R} \land -1 < iz < 0)$$

01.29.27.1944.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \le 1 \lor \operatorname{Re}(z) \le 0 \land \operatorname{Im}(z) < -1 \lor (iz \in \mathbb{R} \land iz > 1)$$

01.29.27.1945.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right) /; (iz \in \mathbb{R} \land 0 < iz < 1)$$

01.29.27.1946.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2i\sqrt{-iz-1}\sqrt{-iz}\sqrt{i+z}}{\sqrt{i-z}}\sqrt{\frac{1}{1-iz}}\sqrt{\frac{i}{z}}\coth^{-1}\left(\frac{\sqrt{i+z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$

01.29.27.1947.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; \operatorname{Re}(z) > 0$$

01.29.27.1948.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\coth^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; \frac{\pi}{2} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1949.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\coth^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1950.01

$$\operatorname{csch}^{-1}(z) = \left(-\sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}} + \frac{1}{2}\right)\pi i + \frac{2 i \sqrt{-i z - 1}\sqrt{1 - i z}\sqrt{z(-i+z)}}{\sqrt{i z + 1}}\sqrt{\frac{1}{z^2+1}}\sqrt{\frac{i}{z}}\coth^{-1}\left(\sqrt{\frac{i+z}{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(z + \sqrt{z^2+1}\right)$

01.29.27.1951.01

$$\operatorname{csch}^{-1}(z) = 2\coth^{-1}\left(z + \sqrt{z^2+1}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1952.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2\coth^{-1}\left(z + \sqrt{z^2+1}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1953.01

$$\operatorname{csch}^{-1}(z) = \pi i - 2\coth^{-1}\left(z + \sqrt{z^2+1}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1954.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z - 1\right) - i\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - 1\right)\right) + \frac{2\sqrt{z}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\coth^{-1}\left(z + \sqrt{z^2+1}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\sqrt{z^2+1} - z\right)$

01.29.27.1955.01

$$\operatorname{csch}^{-1}(z) = -\pi i + 2\coth^{-1}\left(\sqrt{z^2+1} - z\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1956.01

$$\operatorname{csch}^{-1}(z) = \pi i + 2\coth^{-1}\left(\sqrt{z^2+1} - z\right) /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1957.01

$$\operatorname{csch}^{-1}(z) = -2\coth^{-1}\left(\sqrt{z^2+1}-z\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1958.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\pi\left(i\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}-1\right)-\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\,z+1\right)\right)+\frac{2\sqrt{z}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\coth^{-1}\left(\sqrt{z^2+1}-z\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{1}{z+\sqrt{1+z^2}}\right)$

01.29.27.1959.01

$$\operatorname{csch}^{-1}(z) = -\pi i + 2\coth^{-1}\left(\frac{1}{z+\sqrt{1+z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.1960.01

$$\operatorname{csch}^{-1}(z) = \pi i + 2\coth^{-1}\left(\frac{1}{z+\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) \le 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1961.01

$$\operatorname{csch}^{-1}(z) = -2\coth^{-1}\left(\frac{1}{z+\sqrt{1+z^2}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0) \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1962.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\pi\left(i\left(\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}-1\right)-\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\,z+1\right)\right)+\frac{2\sqrt{z}\sqrt{-z^2-1}}{\sqrt{-z}\sqrt{z^2+1}}\coth^{-1}\left(\frac{1}{z+\sqrt{1+z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}-z}\right)$

01.29.27.1963.01

$$\operatorname{csch}^{-1}(z) = 2\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}-z}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z < -1) \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.1964.01

$$\operatorname{csch}^{-1}(z) = -\pi i - 2\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}-z}\right) /; \frac{\pi}{2} < \arg(z) \le \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.1965.01

$$\operatorname{csch}^{-1}(z) = \pi i - 2\coth^{-1}\left(\frac{1}{\sqrt{1+z^2}-z}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.1966.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\frac{z}{\sqrt{-z^2}}\left(\sqrt{\frac{1}{z^2}}\, z - 1\right) - i\left(\sqrt{\frac{1}{z^2+1}}\,\sqrt{z^2+1} - 1\right)\right) + \frac{2\sqrt{z}\,\sqrt{-z^2-1}}{\sqrt{-z}\,\sqrt{z^2+1}}\coth^{-1}\left(\frac{1}{\sqrt{1+z^2} - z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\coth^{-1}(z)$

01.29.27.1967.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi\, i + 2\coth^{-1}(z) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.1968.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi\, i + 2\coth^{-1}(z) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.1969.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi\sqrt{-\frac{1}{z^2}}\, z + 2\coth^{-1}(z) \;/;\; |z| < 1$$

01.29.27.0030.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2\coth^{-1}(z) \;/;\; |z| > 1$$

01.29.27.1970.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{1}{2}\pi z\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2} + 1\right) + \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.1971.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1$$

01.29.27.1972.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \pi\, i - 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.1973.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -\pi\, i - 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1 \bigwedge -\pi < \arg(z) \le 0$$

01.29.27.1974.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = -2\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{z} \;/;\; |z| > 1$$

01.29.27.1975.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right)$ and $\coth^{-1}(z^r)$

01.29.27.1976.01

$$\operatorname{csch}^{-1}\left(\frac{1-z^2}{2z}\right) = 2\,i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\coth^{-1}\left(z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\coth^{-1}(z)$

01.29.27.1977.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i - 2\coth^{-1}(z) \;/;\; |z| < 1 \land (\operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z > 0))$$

01.29.27.1978.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i - 2\coth^{-1}(z) \;/;\; |z| < 1 \land (\operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0))$$

01.29.27.1979.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi\sqrt{-\frac{1}{z^2}}\,z - 2\coth^{-1}(z) \;/;\; |z| < 1$$

01.29.27.1980.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2\coth^{-1}(z) \;/;\; |z| > 1$$

01.29.27.1981.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{\pi z}{2}\sqrt{-\frac{1}{z^2}}\left(\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}+1\right) - \frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.1982.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| < 1$$

01.29.27.1983.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\pi i + 2\coth^{-1}\left(\frac{1}{z}\right) \;/;\; |z| > 1 \bigwedge 0 < \arg(z) \le \pi$$

01.29.27.1984.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = \pi i + 2\coth^{-1}\left(\frac{1}{z}\right) /; |z| > 1 \bigwedge -\pi < \arg(z) \leq 0$$

01.29.27.1985.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = 2\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{z} /; |z| > 1$$

01.29.27.1986.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -\frac{2(1-iz)}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\left(1-\frac{1-iz}{1+iz}\sqrt{\left(\frac{iz+1}{iz-1}\right)^2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right)$ and $\coth^{-1}(z^r)$

01.29.27.1987.01

$$\operatorname{csch}^{-1}\left(\frac{z^2-1}{2z}\right) = -2\, i^{1-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\coth^{-1}\left(z^{-\frac{i+z}{i-z}\sqrt{\left(\frac{i-z}{i+z}\right)^2}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.29.27.1988.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \coth^{-1}\left(\sqrt{z}\right) /; z \notin (0, 1)$$

01.29.27.1989.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\coth^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.0031.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \sqrt{1-\frac{1}{z}}\sqrt{\frac{z}{z-1}}\coth^{-1}\left(\sqrt{z}\right) + \frac{\pi i}{2}\left(\sqrt{\frac{z-1}{z}}\sqrt{\frac{z}{z-1}}-1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.1990.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.1991.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1992.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1993.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \left(\frac{\sqrt{-z}}{\sqrt{z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z-1}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.1994.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 < \arg(z) < \pi$$

01.29.27.1995.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.1996.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.29.27.1997.01

$$\operatorname{csch}^{-1}\left(\sqrt{z-1}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \left(\sqrt{-z}\,\sqrt{\frac{1}{z}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.29.27.1998.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.1999.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.2000.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2001.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{\frac{1}{1-z}}\,\sqrt{1-z}\,\coth^{-1}\left(\sqrt{z}\right) + \frac{\pi\sqrt{z-1}}{2\sqrt{1-z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.2002.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /;\ z \notin (1, \infty)$$

01.29.27.2003.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \pi\, i /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.27.2004.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\,\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi\, i}{2}\left(1 - \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.2005.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ z \notin (1, \infty) \bigwedge z \notin (-\infty, 0)$$

01.29.27.2006.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\ (z \in \mathbb{R} \land z < 0)$$

01.29.27.2007.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \pi\, i /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.27.2008.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z}}\right) = \sqrt{\frac{z}{1-z}}\,\sqrt{\frac{1-z}{z}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi\, i}{2}\left(1 - \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\coth^{-1}\left(\sqrt{z}\right)$

01.29.27.2009.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; 0 < \arg(z) \leq \pi$$

01.29.27.2010.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} - \coth^{-1}\left(\sqrt{z}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.2011.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land z > 0)$$

01.29.27.2012.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\sqrt{z-1}}{\sqrt{-z}} \sqrt{\frac{z}{1-z}} \coth^{-1}\left(\sqrt{z}\right) + \frac{\pi \sqrt{-z}}{2 \sqrt{z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.2013.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (0, \infty)$$

01.29.27.2014.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2015.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi i /; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2016.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \frac{\sqrt{z-1}\, \sqrt{z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi i}{2}\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.2017.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \neg z \in \mathbb{R}$$

01.29.27.2018.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.29.27.2019.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi\, i \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2020.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z}}\right) = -\sqrt{-z^2}\,\sqrt{-\frac{1}{z^2}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi\, i}{2}\left(1 - \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.29.27.2021.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \frac{\pi\, i}{2} + \coth^{-1}(\sqrt{z}) \;/;\; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2022.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi\, i}{2} + \coth^{-1}(\sqrt{z}) \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.2023.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\frac{\pi\, i}{2} - \coth^{-1}(\sqrt{z}) \;/;\; (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land z < 0)$$

01.29.27.2024.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \sqrt{\frac{1-z}{z}}\,\sqrt{\frac{z}{1-z}}\left(\coth^{-1}(\sqrt{z}) + \frac{1}{2}\pi\sqrt{-\frac{1}{z}}\,\sqrt{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.2025.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; z \notin (1, \infty) \bigwedge z \notin (-\infty, 0)$$

01.29.27.2026.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\coth^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.2027.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\pi\, i - \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2028.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \coth^{-1}\left(\frac{1}{\sqrt{z}}\right)\sqrt{\frac{z}{1-z}}\,\sqrt{\frac{1-z}{z}} + \frac{\pi i}{2}\left(\sqrt{1-z}\,\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.2029.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, z \notin (1, \infty)$$

01.29.27.2030.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = -\pi i - \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /;\, (z \in \mathbb{R} \land z > 1)$$

01.29.27.2031.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z}{z}}\right) = \sqrt{1-z}\,\sqrt{\frac{1}{1-z}}\,\coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi i}{2}\left(\sqrt{1-z}\,\sqrt{\frac{1}{1-z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$ and $\coth^{-1}(z)$

01.29.27.2032.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \coth^{-1}(z) /;\, -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2033.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\coth^{-1}(z) /;\, \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2034.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\coth^{-1}(z) - \pi i /;\, (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2035.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \coth^{-1}(z) - \pi i /;\, (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.0032.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{z^2}}{z}\coth^{-1}(z) /;\, z \notin (-1, 1)$$

01.29.27.0033.02

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{z^2-1}}{\sqrt{1-z^2}}\left(\frac{\pi i}{2}\left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right) + \frac{\sqrt{-z^2}}{z}\coth^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2036.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{z}\right) /;\ 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2037.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi i}{2} + \coth^{-1}\left(\frac{1}{z}\right) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2038.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{z}\right) /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2039.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = -\frac{\pi i}{2} - \coth^{-1}\left(\frac{1}{z}\right) /;\ -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2040.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2-1}\right) = \frac{\sqrt{-z^2}\,\sqrt{z^2-1}}{z\sqrt{1-z^2}}\left(\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi\sqrt{-z^2}}{2z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\coth^{-1}(z)$

01.29.27.2041.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2} + \coth^{-1}(z) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2042.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi i}{2} + \coth^{-1}(z) /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2043.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.27.2044.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2} - \coth^{-1}(z) /;\ (z \in \mathbb{R} \land z < -1)$$

01.29.27.2045.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\,z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2046.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \coth^{-1}\left(\frac{1}{z}\right) /;\ z \notin (-\infty, -1) \bigwedge z \notin (1, \infty)$$

01.29.27.2047.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\coth^{-1}\left(\frac{1}{z}\right) - \pi i /;\ (z \in \mathbb{R} \land z > 1)$$

01.29.27.2048.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = -\coth^{-1}\left(\frac{1}{z}\right) + \pi i /;\ (z \in \mathbb{R} \land z < -1)$$

01.29.27.2049.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{z}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \sqrt{\frac{1}{1-z^2}}\,\sqrt{1-z^2}\,\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\coth^{-1}(z)$

01.29.27.2050.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} + \coth^{-1}(z) /;\ 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2051.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} + \coth^{-1}(z) /;\ -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2052.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) /;\ \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2053.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2} - \coth^{-1}(z) \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2054.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{z}\left(\frac{\pi i}{2}\left(-i\sqrt{-\frac{1}{z^2}}\, z + \sqrt{\frac{1}{1-z}}\,\sqrt{1-z} - \sqrt{z+1}\,\sqrt{\frac{1}{z+1}}\right) + \sqrt{1-z^2}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2055.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) /;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2056.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) /;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2057.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi i + \coth^{-1}\left(\frac{1}{z}\right) /;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.2058.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = -\pi i - \coth^{-1}\left(\frac{1}{z}\right) /;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2059.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}}\right) = \frac{\pi i}{2}\left(\sqrt{\frac{1}{1-z}}\,\sqrt{1-z} + \sqrt{\frac{1}{z+1}}\,\sqrt{z+1} - 2\right) + \frac{z\sqrt{1-z^2}}{\sqrt{z^2}}\,\sqrt{\frac{1}{1-z^2}}\,\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\coth^{-1}(z)$

01.29.27.2060.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.2061.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\frac{\pi i}{2}-\coth^{-1}(z)\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee(z\in\mathbb{R}\land z<0)$$

01.29.27.2062.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\frac{\pi i}{2}+\coth^{-1}(z)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee(z\in\mathbb{R}\land z>0)$$

01.29.27.2063.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=-\frac{\pi i}{2}+\coth^{-1}(z)\;/;\;-\pi<\arg(z)\leq-\frac{\pi}{2}$$

01.29.27.2064.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\frac{\sqrt{z}\,\sqrt{z^2-1}}{\sqrt{-z}}\sqrt{\frac{1}{1-z^2}}\coth^{-1}(z)+\frac{\pi\sqrt{-z^4}}{2z^2}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2065.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=-\coth^{-1}\left(\frac{1}{z}\right)\;/;\;-\frac{\pi}{2}<\arg(z)<0\bigvee 0<\arg(z)\leq\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land-1<z<0)$$

01.29.27.2066.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\coth^{-1}\left(\frac{1}{z}\right)\;/;\;\frac{\pi}{2}<\arg(z)<\pi\bigvee-\pi<\arg(z)\leq-\frac{\pi}{2}\bigvee(z\in\mathbb{R}\land 0<z<1)$$

01.29.27.2067.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\coth^{-1}\left(\frac{1}{z}\right)+\pi i\;/;\;(z\in\mathbb{R}\land z>1)$$

01.29.27.2068.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=-\coth^{-1}\left(\frac{1}{z}\right)+\pi i\;/;\;(z\in\mathbb{R}\land z<-1)$$

01.29.27.2069.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}}\right)=\frac{\pi i}{2}\left(2-\sqrt{\frac{1}{1-z}}\sqrt{1-z}-\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right)-\frac{\sqrt{-z}\,\sqrt{z^2-1}}{\sqrt{z}}\sqrt{\frac{1}{1-z^2}}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\coth^{-1}(z)$

01.29.27.2070.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} + \coth^{-1}(z) \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2071.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} + \coth^{-1}(z) \;/;\; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2072.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\frac{\pi i}{2} - \coth^{-1}(z) \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2073.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \frac{\pi i}{2} - \coth^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2074.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = z \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1}{1-z^2}} \coth^{-1}(z) + \frac{1}{2} \pi \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1}{1-z^2}} \sqrt{\frac{z^2}{1-z^2}} \sqrt{z^2-1}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2075.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2076.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) \;/;\; \frac{\pi}{2} \leq \arg(z) < \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2077.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = -\coth^{-1}\left(\frac{1}{z}\right) - \pi i \,/;\, (z \in \mathbb{R} \land z > 1)$$

01.29.27.2078.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \coth^{-1}\left(\frac{1}{z}\right) - \pi i \,/;\, (z \in \mathbb{R} \land z < -1)$$

01.29.27.2079.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1-z^2}{z^2}}\right) = \sqrt{\frac{1}{z^2}}\, z \left(\frac{1}{2} i \pi \left(\sqrt{\frac{1}{1-z}}\, \sqrt{1-z} - \sqrt{\frac{1}{z+1}}\, \sqrt{z+1}\right) + \sqrt{\frac{1}{1-z^2}}\, \sqrt{1-z^2}\, \coth^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4} \middle/ \sqrt{1-\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4} \middle/ \sqrt{1-\sqrt{1-z^2}}\right)$ and $\coth^{-1}(z)$

01.29.27.2080.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} \,/;\, 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2081.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} \,/;\, -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2082.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} \,/;\, \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2083.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} \,/;\, -\pi < \arg(z) \leq -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2084.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\coth^{-1}(z) + \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^2}}\sqrt{z^2} + \sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(1-z^2)^{1/4}\Big/\sqrt{1-\sqrt{1-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2085.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.2086.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.2087.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(1-z^2)^{1/4}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4}\Big/\sqrt{z-\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4}\Big/\sqrt{z-\sqrt{z^2-1}}\right)$ and $\coth^{-1}(z)$

01.29.27.2088.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.2089.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2090.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{2} /; -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2091.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.2092.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) =$$

$$\frac{1}{4}\pi\left(z\sqrt{-\frac{1}{z^2}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{-z-1}\sqrt{-\frac{1}{z+1}} - i\sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\,(z^2-1)^{1/4} \Big/ \sqrt{z-\sqrt{z^2-1}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2093.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \le \frac{\pi}{2} \bigvee -\pi < \arg(z) \le -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 1)$$

01.29.27.2094.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2095.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{3\pi i}{4} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.2096.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}\,(z^2-1)^{1/4}}{\sqrt{z-\sqrt{z^2-1}}}\right) =$$

$$\frac{\pi}{4}\left(i\sqrt{z}\,\sqrt{\frac{1}{z}} + \frac{\sqrt{-z^4}}{z^2} + i\sqrt{\frac{z-1}{z}}\,\sqrt{\frac{z}{z-1}} - 2\,i\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\right) + \frac{1}{2}\sqrt{\frac{1}{z+1}}\,\sqrt{z+1}\,\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2}\Big/\left(1-\sqrt{1-z^2}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2}\Big/\left(1-\sqrt{1-z^2}\right)}\right)$ and $\coth^{-1}(z)$

01.29.27.2097.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} \;/;\; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2098.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} \le \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2099.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{4} \;/;\; \frac{\pi}{2} \le \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2100.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2101.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{\pi i}{4}\left(-i\sqrt{-\frac{1}{z^4}}\, z^2 - \sqrt{\frac{1}{z^2}}\sqrt{z^2} + \sqrt{\frac{z^2}{1-z^2}}\sqrt{\frac{1}{z^2}-1}\right) + \frac{1}{2} z \sqrt{\frac{1}{z^2}} \coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{1-z^2} \Big/ \left(1-\sqrt{1-z^2}\right)}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2102.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.2103.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2104.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{1-\sqrt{1-z^2}}}\right) = \frac{z}{2}\sqrt{\frac{1}{z^2}}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1} \Big/ \left(z-\sqrt{z^2-1}\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1} \Big/ \left(z-\sqrt{z^2-1}\right)}\right)$ and $\coth^{-1}(z)$

01.29.27.2105.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.2106.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2107.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}(z) + \frac{\pi i}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2108.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}(z) - \frac{\pi i}{2} \;/;\; (i z \in \mathbb{R} \land i z > 0) \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.2109.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{\pi}{4}\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{z+1}\sqrt{\frac{1}{z+1}}\left(-\sqrt{z}\sqrt{-\frac{1}{z}} - 2 i \sqrt{z}\sqrt{\frac{1}{z}} + 2 i + \frac{\sqrt{z^2}}{\sqrt{z}}\sqrt{-\frac{1}{z}}\right) - \frac{1}{2} i \sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\coth^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\sqrt{z^2-1}\Big/\left(z-\sqrt{z^2-1}\right)}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.29.27.2110.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \le \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.2111.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2112.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2113.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2114.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\coth^{-1}\left(\frac{1}{z}\right) - \frac{3\pi i}{4} \;/;\; (z \in \mathbb{R} \land z < -1)$$

01.29.27.2115.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{z-\sqrt{z^2-1}}}\right) = \frac{\pi i}{4}\sqrt{\frac{1}{z^2}}\sqrt{z^2}\sqrt{z+1}\sqrt{\frac{1}{z+1}}\left(i\sqrt{-\frac{1}{z^2}}\,z-\sqrt{-\frac{i}{z}}\sqrt{i z}-\sqrt{\frac{1}{1-z^2}}\sqrt{1-z^2}+2\right)-\frac{1}{2}i\sqrt{\frac{i}{z}}\sqrt{i z}\sqrt{\frac{1}{z+1}}\sqrt{z+1}\coth^{-1}\left(\frac{1}{z}\right)$$

Involving sech^{-1}

Involving $\operatorname{csch}^{-1}(z)$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}(i z)$

01.29.27.0036.02

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}(i z) + \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee 0 < i z < 1$$

01.29.27.0037.02

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}(i z) + \frac{\pi i}{2} \;/;\; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee i z > 1$$

01.29.27.2116.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{\pi}{2} - \frac{1}{\sqrt{-\frac{i}{z}-1}}\sqrt{1+\frac{i}{z}}\operatorname{sech}^{-1}(i z)\right)$$

01.29.27.2117.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{\sqrt{\frac{1}{i z}-1}}{\sqrt{1-\frac{1}{i z}}}\operatorname{sech}^{-1}(i z) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}(-i z)$

01.29.27.2118.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}(-i z) - \frac{\pi i}{2} \;/;\; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.2119.01

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}(-i z) - \frac{\pi i}{2} \;/;\; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.0035.01

$$\operatorname{csch}^{-1}(z) = i\left(\frac{1}{\sqrt{\frac{i}{z}-1}}\sqrt{1-\frac{i}{z}}\,\operatorname{sech}^{-1}(-i\,z)-\frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.29.27.2120.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.2121.01

$$\operatorname{csch}^{-1}(z) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2122.01

$$\operatorname{csch}^{-1}(z) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\,z\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-i}}\right)$

01.29.27.2123.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.2124.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) \geq 0 \land \operatorname{Im}(z) \leq -1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 0 \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.2125.01

$$\operatorname{csch}^{-1}(z) = \frac{3\,\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{-z-i}}\right) /; \operatorname{Re}(z) \geq 0 \land -1 < \operatorname{Im}(z) \leq 0$$

01.29.27.2126.01

$$\operatorname{csch}^{-1}(z) = \pi\,i\left(\frac{1}{2} - \frac{\sqrt{-z}}{\sqrt{-i-z}}\sqrt{\frac{i+z}{z}}\right) + \frac{2\,z}{\sqrt{1+i\,z}}\sqrt{\frac{1+i\,z}{z^2}}\,\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{-z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right)$

01.29.27.2127.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{z+i}}\right) /; -\frac{\pi}{2} \leq \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.2128.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) \geq 0 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < -1 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.2129.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right) /; \operatorname{Re}(z) < 0 \land -1 \leq \operatorname{Im}(z) < 0$$

01.29.27.2130.01

$$\operatorname{csch}^{-1}(z) = \pi i\left(\frac{1}{2} - \frac{\sqrt{z}}{\sqrt{i+z}}\sqrt{\frac{i+z}{z}}\right) + \frac{2z}{\sqrt{1+iz}}\sqrt{\frac{1+iz}{z^2}}\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+i}}\right)$

01.29.27.2131.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+i}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land i z > 1) \lor (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.2132.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+i}}\right) /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.2133.01

$$\operatorname{csch}^{-1}(z) = \frac{3\pi i}{2} + 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+i}}\right) /; (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.2134.01

$$\operatorname{csch}^{-1}(z) = \left(\frac{1}{2} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right)\pi i + \frac{2z}{\sqrt{1+iz}}\sqrt{\frac{1+iz}{z^2}}\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right)$

01.29.27.2135.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.2136.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) \leq 0 \land \operatorname{Im}(z) \geq 1 \lor \operatorname{Re}(z) < 0 \land \operatorname{Im}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.2137.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\pi i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-i}}\right) /; \operatorname{Re}(z) \leq 0 \land 0 \leq \operatorname{Im}(z) < 1$$

01.29.27.2138.01

$$\operatorname{csch}^{-1}(z) = i\,\pi\left(\frac{\sqrt{z}}{\sqrt{-i+z}}\sqrt{\frac{-i+z}{z}} - \frac{1}{2}\right) + \frac{2\,z}{\sqrt{1-i\,z}}\sqrt{\frac{1-i\,z}{z^2}}\,\operatorname{sech}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i-z}}\right)$

01.29.27.2139.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) > 1 \lor \operatorname{Re}(z) > 0 \land \operatorname{Im}(z) \le 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.2140.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i-z}}\right) /; \frac{\pi}{2} \le \arg(z) \le \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1) \bigvee (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.2141.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i-z}}\right) /; \operatorname{Re}(z) > 0 \land 0 < \operatorname{Im}(z) \le 1$$

01.29.27.2142.01

$$\operatorname{csch}^{-1}(z) = i\,\pi\left(\frac{\sqrt{-z}}{\sqrt{i-z}}\sqrt{\frac{-i+z}{z}} - \frac{1}{2}\right) + \frac{2\,z}{\sqrt{1-i\,z}}\sqrt{\frac{1-i\,z}{z^2}}\,\operatorname{sech}^{-1}\left(\frac{\sqrt{-2\,z}}{\sqrt{i-z}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2\,z}{z-i}}\right)$

01.29.27.2143.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} + 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2\,z}{z-i}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.2144.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2} - 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2\,z}{z-i}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land i\,z > 1) \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.2145.01

$$\operatorname{csch}^{-1}(z) = -\frac{3\,\pi\,i}{2} - 2\operatorname{sech}^{-1}\left(\sqrt{\frac{2\,z}{z-i}}\right) /; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.2146.01

$$\operatorname{csch}^{-1}(z) = \left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \frac{1}{2}\right)\pi\,i + \frac{2\,z}{\sqrt{1-i\,z}}\sqrt{\frac{1-i\,z}{z^2}}\,\operatorname{sech}^{-1}\left(\sqrt{\frac{2\,z}{z-i}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{-z^2}\right)$

01.29.27.2147.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.2148.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z^2}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.2149.01

$$\operatorname{csch}^{-1}(z) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-z^2}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.2150.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.2151.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z} \sqrt{-z^2-1}}{\sqrt{-z} \sqrt{z^2+1}} \operatorname{sech}^{-1}\left(\sqrt{-z^2}\right) + \frac{\pi \sqrt{-z}}{2 \sqrt{z}}$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$

01.29.27.2152.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; \operatorname{Re}(z) > 0 \lor (i z \in \mathbb{R} \land 0 < i z < 1)$$

01.29.27.2153.01

$$\operatorname{csch}^{-1}(z) = -\pi i - \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \land -1 < i z < 0)$$

01.29.27.2154.01

$$\operatorname{csch}^{-1}(z) = \pi i - \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \land i z > 1) \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.2155.01

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right) /; (i z \in \mathbb{R} \land i z < -1)$$

01.29.27.2156.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi}{2}\left(\sqrt{\frac{1}{z}} \sqrt{-z} - \sqrt{\frac{1}{z^2}}\, z \sqrt{\frac{1}{z}} \sqrt{-z} - i \sqrt{z^2+1} \sqrt{\frac{1}{z^2+1}} + i\right) + z \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{1-i z}} \sqrt{1-i z} \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{1+z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$

01.29.27.2157.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) /; -\frac{\pi}{2} < \arg(z) < \frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.2158.01

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.2159.01

$$\operatorname{csch}^{-1}(z) = -\pi\,i - \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) /; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.2160.01

$$\operatorname{csch}^{-1}(z) = \pi\,i + \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) /; (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.2161.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2}\left(\sqrt{\frac{z-i}{z}}\sqrt{\frac{z}{z-i}} - \sqrt{\frac{z+i}{z}}\sqrt{\frac{z}{z+i}}\right) + z\sqrt{\frac{1}{z^2}}\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$$

01.29.27.2162.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{\frac{1}{z^2}}\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) - \frac{\pi\,i\,z}{2}\sqrt{\frac{1}{z^2}}\left(\frac{\sqrt{z^2}\sqrt{-1-z^2}}{\sqrt{-z^2(1+z^2)}} - 1\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

01.29.27.2163.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.2164.01

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \bigvee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2165.01

$$\operatorname{csch}^{-1}(z) = z\sqrt{\frac{1}{z^2}}\operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{1+z^2}}\right)$

01.29.27.2166.01

$$\operatorname{csch}^{-1}(z) = \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{1+z^2}}\right) /; \operatorname{Re}(z) > 0 \lor (i\,z \in \mathbb{R} \land i\,z > 1)$$

01.29.27.2167.01

$$\operatorname{csch}^{-1}(z) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{1+z^2}}\right) /; \operatorname{Re}(z) < 0 \lor (i\,z \in \mathbb{R} \land i\,z < -1)$$

01.29.27.2168.01

$$\operatorname{csch}^{-1}(z) = \pi\,i + \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{1+z^2}}\right) /; (i\,z \in \mathbb{R} \land 0 < i\,z < 1)$$

01.29.27.2169.01

$$\operatorname{csch}^{-1}(z) = -\pi\,i - \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; (i\,z \in \mathbb{R} \land -1 < i\,z < 0)$$

01.29.27.2170.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{2}\left(\sqrt{\frac{z}{z-i}}\sqrt{\frac{z-i}{z}} - \sqrt{\frac{z}{z+i}}\sqrt{\frac{z+i}{z}}\right) + z\sqrt{\frac{1}{z^2}}\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\operatorname{csch}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(-\frac{z^2}{2\sqrt{-1-z^2}}\right)$

01.29.27.2171.01

$$\operatorname{csch}^{-1}(z) = \frac{\sqrt{z^2}}{2\,z}\operatorname{sech}^{-1}\left(-\frac{z^2}{2\sqrt{-1-z^2}}\right) + \frac{\pi\sqrt{-z^2}}{4\,z} /; z \notin (-\infty, 1)$$

01.29.27.2172.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi\,i}{4}\sqrt{\frac{z^2+2}{z^2}}\sqrt{\frac{z^2}{z^2+2}}\left(\frac{i\,z}{\sqrt{-z^2}} - \sqrt{1-\frac{i\sqrt{2}}{z}}\sqrt{\frac{i\,z}{i\,z+\sqrt{2}}} + \sqrt{1+\frac{i\sqrt{2}}{z}}\sqrt{-\frac{i\,z}{\sqrt{2}-i\,z}}\right) +$$
$$\frac{z\sqrt{-z^2-2}}{2\sqrt{-z^2\left(z^2+2\right)}}\operatorname{sech}^{-1}\left(-\frac{z^2}{2\sqrt{-1-z^2}}\right)$$

01.29.27.2173.01

$$\operatorname{csch}^{-1}(z) = \frac{\pi i}{4}\left(i\sqrt{-\frac{1}{z^2}}\, z + \frac{i z}{\sqrt{-\frac{z^2+1}{z^2}}}\sqrt{\frac{z^2+1}{z^4}} + \sqrt{\frac{i}{z}}\sqrt{\frac{i\sqrt{2}+z}{z}}\sqrt{-i z}\sqrt{\frac{i z}{i z-\sqrt{2}}} - \sqrt{-\frac{i}{z}}\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{i z}\sqrt{\frac{i z}{i z+\sqrt{2}}}\right) + \frac{z}{2\sqrt{\frac{z^2+2}{z^2}}\sqrt{-z^2-1}\sqrt{\frac{z^2+1}{z^4}}}\sqrt{\frac{1}{z^2}}\sqrt{-\frac{z^2+2}{z^2}}\sqrt{-\frac{\left(z^2+1\right)^2}{z^4}}\left(\frac{\pi}{2} - \frac{1}{\sqrt{-\frac{2\sqrt{-z^2-1}}{z^2}-1}}\sqrt{\frac{2\sqrt{-z^2-1}}{z^2}+1}\ \operatorname{sech}^{-1}\left(-\frac{z^2}{2\sqrt{-1-z^2}}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{-z}\right)$

01.29.27.2174.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.2175.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /;\ -\pi < \arg(z) \leq 0$$

01.29.27.2176.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = -\frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-z}\right) /;\ (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2177.01

$$\operatorname{csch}^{-1}\left(\sqrt{z}\right) = \sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}}\ \operatorname{sech}^{-1}\left(\sqrt{-z}\right) + \frac{\pi\sqrt{-z}}{2\sqrt{z}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.29.27.2178.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /;\ \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.2179.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; -\pi < \arg(z) \leq 0$$

01.29.27.2180.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2181.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi \sqrt{-z^2}}{2 z}$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.29.27.2182.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2183.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0$$

01.29.27.2184.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi i}{2} - \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) /; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2185.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \operatorname{sech}^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{1}{2} \pi \sqrt{-\frac{1}{z}} \sqrt{z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{c z^2}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\operatorname{sech}^{-1}(i z)$

01.29.27.2186.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}(i z) + \frac{\pi i}{2} /; \operatorname{Re}(z) > 0$$

01.29.27.2187.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \operatorname{sech}^{-1}(i z) - \frac{\pi i}{2} /; \operatorname{Re}(z) < 0 \lor (i z \in \mathbb{R} \land i z > 1)$$

01.29.27.2188.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -\operatorname{sech}^{-1}(i z) + \frac{\pi i}{2} /; (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.2189.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = -\operatorname{sech}^{-1}(i\,z) - \frac{\pi\,i}{2} \;/;\; (i\,z \in \mathbb{R} \wedge 0 < i\,z < 1)$$

01.29.27.2190.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \sqrt{i\,z - 1}\,\sqrt{\frac{1}{i\,z - 1}}\,\operatorname{sech}^{-1}(i\,z) + \frac{\pi\,i\,\sqrt{z^2}}{2\,z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2191.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \operatorname{sech}^{-1}(z) + \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) > 0$$

01.29.27.2192.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \operatorname{sech}^{-1}(z) - \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.2193.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -\operatorname{sech}^{-1}(z) + \frac{\pi\,i}{2} \;/;\; (z \in \mathbb{R} \wedge z < 0)$$

01.29.27.2194.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = -\operatorname{sech}^{-1}(z) - \frac{\pi\,i}{2} \;/;\; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.2195.01

$$\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) = \sqrt{z - 1}\,\sqrt{\frac{1}{z - 1}}\,\operatorname{sech}^{-1}(z) - \frac{\pi\,\sqrt{-z^2}}{2\,z}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{z^2}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.29.27.2196.01

$$\operatorname{csch}^{-1}\left(\sqrt{z^2}\right) = \frac{1}{2}\,\sqrt{\frac{1}{z^2}}\,\sqrt{z^2}\,\operatorname{sech}^{-1}\left(\frac{z^2}{z^2 + 2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.2197.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z - 1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.2198.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.29.27.2199.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \pi i + \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.2200.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)\frac{\pi i}{2} + \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

01.29.27.2201.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}}\left(\frac{\sqrt{-z^2}}{z}\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1-z}}\right) + \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.29.27.2202.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; z \notin (-\infty, 1)$$

01.29.27.2203.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \land z < 1)$$

01.29.27.2204.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \sqrt{z-1}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.29.27.2205.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (-\infty, 1)$$

01.29.27.2206.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2207.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = -\pi i - \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.2208.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z-1}}\right) = \frac{\pi i}{2}\left(\sqrt{z}\sqrt{\frac{1}{z}} - 1\right) + \sqrt{\frac{1}{z-1}}\sqrt{z-1}\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2209.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} /; \operatorname{Im}(z) > 0 \lor (z \in \mathbb{R} \land z < -1)$$

01.29.27.2210.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.2211.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{2} /; (z \in \mathbb{R} \land -1 < z < 1)$$

01.29.27.2212.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{-1-z}}\right) = \frac{\sqrt{z+1}\sqrt{1-z}}{2\sqrt{-z-1}\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{z+1}}{2\sqrt{-z-1}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2213.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(-\frac{1}{z}\right)$

01.29.27.2214.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{z-1}}\right) = \frac{1}{2}\sqrt{\frac{1}{1-z}}\sqrt{-\frac{1}{z}}\sqrt{(1-z)\,z}\left(\pi - \frac{\sqrt{z+1}}{\sqrt{-z-1}}\operatorname{sech}^{-1}\left(-\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{c\,z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2215.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} \;/;\; 0 < \arg(z) \leq \pi \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2216.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi\,i}{2} \;/;\; \operatorname{Im}(z) < 0$$

01.29.27.2217.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\,i}{2} \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2218.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-z-1}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z}}\sqrt{z}\left(\frac{\sqrt{z-1}}{\sqrt{1-z}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi\right)$$

01.29.27.2219.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{-1-z}}\right) = \frac{\sqrt{1-z^2}}{2\sqrt{z-1}}\sqrt{-\frac{1}{z+1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{1}{2}\pi\sqrt{-\frac{1}{z+1}}\sqrt{z+1}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2220.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; z \notin (-\infty, 1)$$

01.29.27.2221.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land z < 1)$$

01.29.27.2222.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(-\frac{1}{z}\right)$

01.29.27.2223.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{z-1}}\right) = \frac{\sqrt{-z}}{2} \sqrt{\frac{1}{z}} \left(\frac{\sqrt{z+1}}{\sqrt{-z-1}} \operatorname{sech}^{-1}\left(-\frac{1}{z}\right) - \pi\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.29.27.2224.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /; |\arg(z)| < \pi$$

01.29.27.2225.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{z}\right) - \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.0040.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z}}{\sqrt{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) \sqrt{\frac{1}{z}} \sqrt{z} + \frac{\pi i}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.29.27.2226.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{z}\right) /; z \notin (-\infty, 1)$$

01.29.27.2227.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2228.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) + \pi i /; (z \in \mathbb{R} \land z < 0)$$

01.29.27.2229.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{z-1}}\right) = -\sqrt{z-1}\,\sqrt{\frac{1}{z-1}}\,\operatorname{sech}^{-1}\left(\sqrt{z}\right) + \frac{\pi\,i}{2}\left(1-\sqrt{z}\,\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{z}\right)$

01.29.27.2230.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right) /;\, z \notin (-\infty, 0) \bigwedge z \notin (1, \infty)$$

01.29.27.2231.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\operatorname{sech}^{-1}\left(\sqrt{z}\right) /;\, (z \in \mathbb{R} \land z > 1)$$

01.29.27.2232.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = -\pi\,i - \operatorname{sech}^{-1}\left(\sqrt{z}\right) /;\, (z \in \mathbb{R} \land z < 0)$$

01.29.27.0039.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z}{1-z}}\right) = \operatorname{sech}^{-1}\left(\sqrt{z}\right)\sqrt{\frac{z}{1-z}}\,\sqrt{\frac{1-z}{z}} + \frac{\pi\,i}{2}\left(\sqrt{z}\,\sqrt{\frac{1}{z}} - 1\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2233.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi\,i}{2} /;\, \operatorname{Im}(z) > 0$$

01.29.27.2234.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi\,i}{2} /;\, (i\,m(z) \in \mathbb{R} \land i\,m(z) < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.2235.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi\,i}{2} /;\, (z \in \mathbb{R} \land z < 0)$$

01.29.27.2236.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2\,z}}{\sqrt{-z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi\,i}{2} /;\, (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2237.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-z-1}}\right) = \frac{\pi\sqrt{-z^2}}{2z} - \frac{1}{2}\sqrt{z-1}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2238.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z)\ /;\ |\arg(z)| < \pi$$

01.29.27.2239.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z)\ /;\ (z \in \mathbb{R} \land z < 0)$$

01.29.27.0042.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{1-z}}\right) = \frac{1}{2}\sqrt{z}\sqrt{\frac{1}{z}}\operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-a}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2240.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2}\ /;\ \operatorname{Im}(z) > 0$$

01.29.27.2241.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2}\ /;\ \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1) \lor (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2242.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2}\ /;\ (z \in \mathbb{R} \land z < -1)$$

01.29.27.2243.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2}\ /;\ (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2244.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z-1}\sqrt{z-1}\sqrt{z}}{2\sqrt{1-z^2}}\sqrt{\frac{1}{z}}\operatorname{sech}^{-1}(z) - \frac{\pi\sqrt{-z-1}}{2\sqrt{z+1}}$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2245.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) \,/;\, z \notin (-\infty, 1)$$

01.29.27.2246.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) \,/;\, (z \in \mathbb{R} \land z < 1)$$

01.29.27.2247.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z-1}}\right) = -\frac{\sqrt{z-1}}{2}\sqrt{\frac{1}{z-1}}\operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{a-z}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2248.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) + \frac{\pi i}{2} \,/;\, \operatorname{Im}(z) > 0$$

01.29.27.2249.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \,/;\, \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.2250.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) - \frac{\pi i}{2} \,/;\, (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2251.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{-z-1}}\right) = \frac{1}{2}\sqrt{\frac{z}{z-1}}\sqrt{\frac{z-1}{z}}\operatorname{sech}^{-1}(z) - \frac{\pi\sqrt{-z}}{2}\sqrt{\frac{1}{z}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2252.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{1}{2}\operatorname{sech}^{-1}(z) \,/;\, z \notin (-\infty, 0) \land z \notin (1, \infty)$$

01.29.27.2253.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 0) \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.0034.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) = \frac{1}{2}\sqrt{\frac{z}{1-z}}\sqrt{\frac{1-z}{z}}\operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2254.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; -\frac{\pi}{2} < \arg(z) \le \frac{\pi}{2}$$

01.29.27.2255.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi\, i \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2256.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; -\pi < \arg(z) \le -\frac{\pi}{2}$$

01.29.27.2257.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi\, i \;/;\; (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2258.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi\, i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) \;/;\; \operatorname{Re}(z) > 0 \lor \operatorname{Im}(z) > 0$$

01.29.27.2259.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi\, i}{2}\left(\frac{\sqrt{z^2}}{z} - 1\right) + 2\, i\, \pi \;/;\; \operatorname{Im}(z) < 0 \land \operatorname{Re}(z) \le 0$$

01.29.27.2260.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{\sqrt{z-1}\, z\sqrt{z+1}}{\sqrt{z^2}\sqrt{z^2-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

01.29.27.2261.01

$$\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) = \frac{\pi\sqrt{1-z^2}}{2\sqrt{z^2-1}}\left(\frac{\sqrt{z^2}}{z}-1\right) + \frac{z}{\sqrt{z-1}\sqrt{z+1}}\sqrt{\frac{z^2-1}{z^2}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2262.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2263.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.29.27.2264.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2265.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \land i z < 0) \lor (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2266.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = -\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \pi i /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.2267.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) = \frac{\pi}{2}\sqrt{1-z^2}\sqrt{\frac{1}{z^2-1}}\left(\frac{\sqrt{z^2}}{z}-1\right) + \frac{\sqrt{z-1}\, z\sqrt{z+1}}{\sqrt{z^2}}\sqrt{\frac{1}{z^2-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.0043.02

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.29.27.2268.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) - \pi i /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.29.27.2269.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi i /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2270.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi i /; (z \in \mathbb{R} \land z < -1)$$

01.29.27.2271.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \frac{\pi \sqrt{z^2 - z^4}}{2 z \sqrt{z^2 - 1}} \left(1 - \sqrt{\frac{1}{z^2}}\, z\right) + \sqrt{\frac{1}{z+1}} \sqrt{z+1}\, z \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z)$$

01.29.27.2272.01

$$\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + z \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2273.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) /; \operatorname{Re}(z) > 0$$

01.29.27.2274.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2275.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi i /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 0)$$

01.29.27.2276.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) + \pi\, i \,/;\, (z \in \mathbb{R} \land z < -1)$$

01.29.27.2277.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) = \frac{\pi \sqrt{1-z^2}}{2\sqrt{z^2-1}} \left(1 - \sqrt{\frac{1}{z^2}}\, z\right) + \sqrt{\frac{z+1}{1-z}}\, (1-z) \sqrt{\frac{1}{z^2}} \sqrt{\frac{z^2}{1-z^2}}\, \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2278.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}(z) \,/;\, -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2279.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}(z) \,/;\, (z \in \mathbb{R} \land 0 < z < 1) \lor (i\, z \in \mathbb{R} \land i\, z > 0)$$

01.29.27.2280.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}(z) - \pi\, i \,/;\, \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2281.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = -\operatorname{sech}^{-1}(z) + \pi\, i \,/;\, -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2282.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}(z) + \pi\, i \,/;\, (i\, z \in \mathbb{R} \land i\, z < 0)$$

01.29.27.2283.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \operatorname{sech}^{-1}(z) - \pi\, i \,/;\, (z \in \mathbb{R} \land z < 0)$$

01.29.27.2284.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi \sqrt{-z^2}}{2\sqrt{z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + \frac{\sqrt{1-z}\, \sqrt{-z}\, \sqrt{z^2}}{\sqrt{z-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z^2}}\, \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2285.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2286.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \operatorname{sech}^{-1}(z) + \pi i /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2287.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \operatorname{sech}^{-1}(z) - \pi i /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.2288.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) /; (z \in \mathbb{R} \land z > 1) \lor (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.2289.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = -\operatorname{sech}^{-1}(z) - \pi i /; (i z \in \mathbb{R} \land i z < 0)$$

01.29.27.2290.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) = \frac{\pi \sqrt{-1+z^2}}{2} \sqrt{\frac{1}{1-z^2}} \left(\sqrt{\frac{1}{z^2}}\, z - 1\right) + \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{z^2} \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2291.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2 z \sqrt{z^2-1}}\right) = \frac{2 z^2}{\sqrt{-z^4}} \left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3 \pi}{4}$$

01.29.27.2292.01

$$\operatorname{csch}^{-1}\left(\frac{1}{2\,z\,\sqrt{z^2-1}}\right) = \frac{\pi\,\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{2\,\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\,\sqrt{z}\,\sqrt{\frac{1}{\sqrt{2}\,z+1}}\,\sqrt{\sqrt{2}\,z+1} + \sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{1}{1-\sqrt{2}\,z}}\,\sqrt{1-\sqrt{2}\,z} + \frac{\sqrt{z^4-z^2}}{z\,\sqrt{z^2-1}}\right) - \frac{2\,\sqrt{1-2\,z^2}\,\sqrt{z^4-z^2}}{\sqrt{-z^2}\,\sqrt{1-z^2}\,\sqrt{2\,z^2-1}} \left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2293.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\,\sqrt{1-z^2}}\right) = -\frac{2\,z\,\sqrt{z^2-1}}{\sqrt{z^2-z^4}} \left(\frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right) /;\ |z| \geq \sqrt{2} \bigvee \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\,\pi}{4}$$

01.29.27.2294.01

$$\operatorname{csch}^{-1}\left(\frac{z^2}{2\,\sqrt{1-z^2}}\right) = \frac{z}{2\,\sqrt{-\frac{1}{z^2}}\,\sqrt{-z^4+3\,z^2-2}}\,\sqrt{\frac{1-z^2}{z^4}}\,\sqrt{z^2-2} \left(\pi\left(\frac{z^3}{1-z^2}\,\sqrt{\frac{1-z^2}{z^2}}\,\sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}}\,z - \sqrt{\frac{1}{z}}\,\sqrt{\frac{z}{z+\sqrt{2}}}\,\sqrt{\frac{z+\sqrt{2}}{z}}\,\sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}}\,\sqrt{-\frac{1}{z}}\,\sqrt{-z}\,\sqrt{\frac{z}{z-\sqrt{2}}} - 2\right) + 4\,\frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2}\middle/\sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2} \Big/ \sqrt{\sqrt{1-z^2}-1}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2295.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \pi$$

01.29.27.2296.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.2297.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2298.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2\Big/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2299.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1) \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2300.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) \;/;\; \operatorname{Im}(z) < 0 \lor (z \in \mathbb{R} \land z > 1)$$

01.29.27.2301.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.29.27.2302.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2}{\sqrt{1-z^2}-1}}\right) = \frac{z\sqrt{z^2-1}}{2\sqrt{z^2-z^4}}\left(\frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2} \Big/ \left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z^2} \Big/ \left(z\sqrt{\sqrt{1-z^2}-1}\right)\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2303.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.29.27.2304.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.29.27.2305.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.29.27.2306.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^4}}{2z^2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2 \Big/ \left(\sqrt{1-z^2}-1\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{2z^2/\left(\sqrt{1-z^2}-1\right)}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.29.27.2307.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land -1 < z < 1)$$

01.29.27.2308.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2309.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi i}{4} \;/;\; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \land z < -1)$$

01.29.27.2310.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{4} \;/;\; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.29.27.2311.01

$$\operatorname{csch}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{z^2-1}}{2\sqrt{z-1}\sqrt{z+1}}\operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi\sqrt{z^2-1}}{4\sqrt{1-z^2}}$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z}/\sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z}/\sqrt{\sqrt{z^2-1}-z}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2312.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1) \bigvee (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.2313.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\frac{\pi}{2} < \arg(z) < 0$$

01.29.27.2314.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2315.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; -\pi < \arg(z) < -\frac{\pi}{2}$$

01.29.27.2316.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z < 0)$$

01.29.27.2317.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) \;/;\; (z \in \mathbb{R} \land z > 1)$$

01.29.27.2318.01

$$\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{z\,4}\sqrt{-z^2}\left(1 - \frac{i\sqrt{-i\,z}}{\sqrt{i\,z}}\right) - \frac{i}{2}\sqrt{-\frac{1}{z}}\,\sqrt{\frac{i}{z}}\,\sqrt{i\,z}\,\sqrt{z}\left(\frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}}\operatorname{sech}^{-1}(z)\right)$$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$

Involving $\operatorname{csch}^{-1}\left(\sqrt{2z\Big/\left(\sqrt{z^2-1}-z\right)}\right)$ and $\operatorname{sech}^{-1}(z)$

01.29.27.2319.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \bigvee (z \in \mathbb{R} \land 0 < z < 1)$$

01.29.27.2320.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \land z > 1)$$

01.29.27.2321.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = \frac{3\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.29.27.2322.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{3\pi i}{4} + \frac{1}{2}\operatorname{sech}^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \land z < 0)$$

01.29.27.2323.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) = -\frac{\pi i}{4} - \frac{1}{2}\operatorname{sech}^{-1}(z) /; (i z \in \mathbb{R} \land i z > 0)$$

01.29.27.2324.01

$$\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{\sqrt{z^2-1}-z}}\right) =$$

$$\frac{\pi}{4}\left(3 i \sqrt{\frac{1}{z}} \sqrt{z} + \frac{2z}{\sqrt{-z^2}} + \frac{\sqrt{-z^4}}{z^2} - i\left(\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} + \sqrt{\frac{i}{z}} \sqrt{-i z} + 1\right)\right) + \frac{1}{2} \sqrt{-i z} \sqrt{\frac{i}{z}} \operatorname{sech}^{-1}(z)$$

Inequalities

01.29.29.0001.01

$$\operatorname{csch}^{-1}(x) > 0 /; x \in \mathbb{R} \land x > 0$$

History

The function csch^{-1} is encountered often in mathematics and the natural sciences.

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