

ArcCsc

View the online version at

● functions.wolfram.com

Download the

● PDF File

Notations

Traditional name

Inverse cosecant

Traditional notation

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

Mathematica StandardForm notation

ArcCsc[z]

Primary definition

01.17.02.0001.01

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

The function $\csc^{-1}(z)$ can also be defined as the inverse function for $\csc(w)$:

$w = \csc^{-1}(z)$ if and only if $\csc(w) = z$.

Specific values

Values at fixed points

01.17.03.0001.01

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

01.17.03.0002.01

$$\csc^{-1}(1) = \frac{\pi}{2}$$

01.17.03.0003.01

$$\csc^{-1}(-1) = -\frac{\pi}{2}$$

01.17.03.0004.01

$$\csc^{-1}(\sqrt{6} - \sqrt{2}) = \frac{5\pi}{12}$$

01.17.03.0005.01

$$\csc^{-1}(\sqrt{2} - \sqrt{6}) = -\frac{5\pi}{12}$$

01.17.03.0006.01

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

01.17.03.0007.01

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

01.17.03.0008.01

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

01.17.03.0009.01

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

01.17.03.0010.01

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

01.17.03.0011.01

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

01.17.03.0012.01

$$\csc^{-1}(\sqrt{5} - 1) = \frac{3\pi}{10}$$

01.17.03.0013.01

$$\csc^{-1}(1 - \sqrt{5}) = -\frac{3\pi}{10}$$

01.17.03.0014.01

$$\csc^{-1}(\sqrt{2}) = \frac{\pi}{4}$$

01.17.03.0015.01

$$\csc^{-1}(-\sqrt{2}) = -\frac{\pi}{4}$$

01.17.03.0016.01

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

01.17.03.0017.01

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

01.17.03.0018.01

$$\csc^{-1}(2)=\frac{\pi}{6}$$

01.17.03.0019.01

$$\csc^{-1}(-2)=-\frac{\pi}{6}$$

01.17.03.0020.01

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

01.17.03.0021.01

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

01.17.03.0022.01

$$\csc^{-1}(1+\sqrt{5})=\frac{\pi}{10}$$

01.17.03.0023.01

$$\csc^{-1}(-1-\sqrt{5})=-\frac{\pi}{10}$$

01.17.03.0024.01

$$\csc^{-1}(\sqrt{6}+\sqrt{2})=\frac{\pi}{12}$$

01.17.03.0025.01

$$\csc^{-1}(-\sqrt{6}-\sqrt{2})=-\frac{\pi}{12}$$

01.17.03.0026.01

$$\csc^{-1}(i)=-i\log(\sqrt{2}+1)$$

01.17.03.0027.01

$$\csc^{-1}(-i)=-i\log(\sqrt{2}-1)$$

Values at infinities

01.17.03.0028.01

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

01.17.03.0029.01

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

01.17.03.0030.01

$$\csc^{-1}(i\infty)=0$$

01.17.03.0031.01

$$\csc^{-1}(-i\infty)=0$$

01.17.03.0032.01

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

General characteristics

Domain and analyticity

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

01.17.04.0001.01

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

Symmetries and periodicities

Parity

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

01.17.04.0002.01

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

Mirror symmetry

01.17.04.0003.01

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

Periodicity

No periodicity

Poles and essential singularities

The function $\csc^{-1}(z)$ has one singular point:

$z = \infty$ is the simple pole with residue -1 .

01.17.04.0004.01

$$\text{Sing}_z(\csc^{-1}(z)) = \{\{\infty, 1\}\}$$

01.17.04.0005.01

$$\text{res}_z(\csc^{-1}(z))(\infty) = -1$$

Branch points

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

01.17.04.0006.01

$$\mathcal{BP}_z(\csc^{-1}(z)) = \{-1, 0, 1\}$$

01.17.04.0007.01

$$\mathcal{R}_z(\csc^{-1}(z), 1) = 2$$

01.17.04.0008.01

$$\mathcal{R}_z(\csc^{-1}(z), -1) = 2$$

01.17.04.0009.01

$$\mathcal{R}_z(\csc^{-1}(z), 0) = \log$$

Branch cuts

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

The function $\csc^{-1}(z)$ is continuous from below on the interval $(-1, 0)$ and from above on the interval $(0, 1)$.

01.17.04.0010.01

$$\mathcal{BC}_z(\csc^{-1}(z)) = \{[-1, 0), i\}, \{(0, 1], -i\}$$

01.17.04.0011.01

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

01.17.04.0012.01

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

01.17.04.0013.01

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

01.17.04.0014.01

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

Analytic continuations

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

Series representations

Generalized power series

Expansions at generic point $z = z_0$

For the function itself

01.17.06.0023.01

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

$$\frac{\pi}{2} + \left(\frac{z_0}{z_0 - 1}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z-z_0}{z z_0}\right)}{2\pi} \right] \left(\frac{z_0 - 1}{z_0}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z-z_0}{z z_0}\right)}{2\pi} \right] \left(2 i i \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \pi \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \left[\frac{\arg\left(\frac{z_0+1}{z_0}\right) + \pi}{2\pi} \right] - \left(\frac{z_0}{z_0 + 1}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \left(\frac{z_0 + 1}{z_0}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \right) \left(\sec^{-1}(z_0) + \frac{1}{z_0^2 \sqrt{\frac{z_0^2-1}{z_0^2}}} (z-z_0) - \frac{(2z_0^2-1)}{2\sqrt{1-\frac{1}{z_0^2}} z_0^3 (z_0^2-1)} (z-z_0)^2 + \dots \right) /; (z \rightarrow z_0)$$

01.17.06.0024.01

$$\csc^{-1}(z) \propto \frac{\pi}{2} + \left(\frac{z_0}{z_0 - 1}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z-z_0}{z z_0}\right)}{2\pi} \right] \left(\frac{z_0 - 1}{z_0}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z-z_0}{z z_0}\right)}{2\pi} \right] \left(2 i i \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \pi \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \left[\frac{\arg\left(\frac{z_0+1}{z_0}\right) + \pi}{2\pi} \right] - \left(\frac{z_0}{z_0 + 1}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \left(\frac{z_0 + 1}{z_0}\right)^{\frac{1}{2}} \left[\frac{\arg\left(\frac{z_0-z}{z z_0}\right)}{2\pi} \right] \left(\sec^{-1}(z_0) + \frac{1}{z_0^2 \sqrt{\frac{z_0^2-1}{z_0^2}}} (z-z_0) - \frac{(2z_0^2-1)}{2\sqrt{1-\frac{1}{z_0^2}} z_0^3 (z_0^2-1)} (z-z_0)^2 + O((z-z_0)^3) \right) \right)$$

01.17.06.0025.01

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

01.17.06.0026.01

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

Expansions on branch cuts

For the function itself

In the left half-plane

01.17.06.0027.01

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

$(z \rightarrow x) \wedge x \in \mathbb{R} \wedge -1 < x < 0$

01.17.06.0028.01

$$\csc^{-1}(z) \propto \frac{\pi}{2} + \left(2\pi i e^{\frac{1}{2}(\pi i) \left\lfloor \frac{\arg(x-z)}{2\pi} \right\rfloor} \left\lfloor \frac{\arg(x-z)}{2\pi} \right\rfloor - e^{\pi i \left\lfloor \frac{\arg(x-z)}{2\pi} \right\rfloor} \left(\sec^{-1}(x) - \frac{z-x}{x\sqrt{x^2-1}} + \frac{(2x^2-1)(z-x)^2}{2\sqrt{x^2-1}x^2(x^2-1)} + O((z-x)^3) \right) \right) /;$$

$x \in \mathbb{R} \wedge -1 < x < 0$

01.17.06.0029.01

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

$x \in \mathbb{R} \wedge -1 < x < 0$

01.17.06.0030.01

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

In the right half-plane

01.17.06.0031.01

$$\csc^{-1}(z) \propto \frac{\pi}{2} - e^{\pi i \left\lfloor \frac{\arg(z-x)}{2\pi} \right\rfloor} \left(\sec^{-1}(x) + \frac{z-x}{x\sqrt{x^2-1}} - \frac{(2x^2-1)(z-x)^2}{2\sqrt{x^2-1}x^2(x^2-1)} + \dots \right) /; (z \rightarrow x) \wedge x \in \mathbb{R} \wedge 0 < x < 1$$

01.17.06.0032.01

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

01.17.06.0033.01

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

01.17.06.0034.01

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

Expansions at $z = 0$

For the function itself

01.17.06.0001.02

$$\csc^{-1}(z) \propto \frac{1}{2} \sqrt{-\frac{1}{z^2}} z \left(-\log\left(-\frac{4}{z^2}\right) + \frac{z^2}{2} + \frac{3z^4}{16} + \frac{5z^6}{48} + \dots \right); (z \rightarrow 0)$$

01.17.06.0035.01

$$\csc^{-1}(z) \propto \frac{1}{2} \sqrt{-\frac{1}{z^2}} z \left(-\log\left(-\frac{4}{z^2}\right) + \frac{z^2}{2} + \frac{3z^4}{16} + \frac{5z^6}{48} + O(z^8) \right)$$

01.17.06.0002.01

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

01.17.06.0003.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{-\frac{1}{z^2}} z \left(-\log\left(-\frac{4}{z^2}\right) + \frac{1}{2} z^2 {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; z^2\right) \right); z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.06.0004.02

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

01.17.06.0036.01

$$\csc^{-1}(z) \propto \begin{cases} i \log(z) & 0 \leq \arg(z) < \pi \\ -i \log(z) & \text{True} \end{cases}; (z \rightarrow 0)$$

01.17.06.0037.01

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

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.17.06.0038.01

$$\csc^{-1}(z)^2 \propto -\frac{1}{4} \log^2\left(-\frac{1}{z^2}\right) + \log\left(-\frac{1}{z^2}\right) \left(-\log(2) + \frac{z^2}{4} + \frac{3z^4}{32} + \dots \right) + \left(-\log^2(2) + \frac{1}{2} \log(2) z^2 + \frac{1}{16} (3 \log(2) - 1) z^4 + \dots \right); (z \rightarrow 0)$$

01.17.06.0039.01

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

01.17.06.0040.01

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

01.17.06.0041.01

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

01.17.06.0042.01

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

01.17.06.0043.01

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

01.17.06.0044.01

$$\csc^{-1}(z)^2 = -\frac{1}{4} \log^2\left(-\frac{4}{z^2}\right)^2 + \frac{z^2}{4} \log\left(-\frac{4}{z^2}\right) {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; z^2\right) - \frac{z^4}{16} {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; z^2\right)^2 ; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.06.0045.01

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

01.17.06.0046.01

$$\csc^{-1}(z)^2 \propto -\log^2(z) ; (z \rightarrow 0)$$

01.17.06.0047.01

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

Summed form of the truncated series expansion.

Expansions at $z = 1$

For the function itself

01.17.06.0005.02

$$\csc^{-1}(z) \propto \frac{\pi}{2} - \sqrt{2} \sqrt{z-1} \left(1 - \frac{5(z-1)}{12} + \frac{43(z-1)^2}{160} - \dots \right); (z \rightarrow 1)$$

01.17.06.0048.01

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

01.17.06.0006.01

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

01.17.06.0007.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \sqrt{2} \sqrt{z-1} F_{0 \times 1 \times 1}^{1 \times 1 \times 1} \left(\begin{matrix} \frac{3}{2}, \frac{1}{2}, \frac{1}{2} \\ \frac{3}{2}, \frac{3}{2} \end{matrix}; -1, 1-z \right)$$

01.17.06.0008.02

$$\csc^{-1}(z) \propto \frac{\pi}{2} - \sqrt{2} \sqrt{z-1} (1 + \mathcal{O}(z-1))$$

01.17.06.0049.01

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

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.17.06.0050.01

$$\csc^{-1}(z)^2 \propto \frac{\pi^2}{4} - \sqrt{2} \pi \sqrt{z-1} \left(1 - \frac{5(z-1)}{12} + \frac{43(z-1)^2}{160} + \dots \right) + 2(z-1) \left(1 - \frac{5}{6}(z-1) + \frac{32}{45}(z-1)^2 + \dots \right); (z \rightarrow 1)$$

01.17.06.0051.01

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

01.17.06.0052.01

$$\begin{aligned} \csc^{-1}(z)^2 &= \frac{\pi^2}{4} - 2\pi\sqrt{z-1} \sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k + \frac{3}{2}; \frac{3}{2}; -1\right) (z-1)^k + \\ &4(z-1) \left(\sum_{k=0}^{\infty} \frac{(-1)^k \left(\frac{1}{2}\right)_k}{k!} {}_2F_1\left(\frac{1}{2}, k + \frac{3}{2}; \frac{3}{2}; -1\right) (z-1)^k \right)^2 \quad ; |z-1| < 2 \end{aligned}$$

01.17.06.0053.01

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

01.17.06.0054.01

$$\csc^{-1}(z)^2 \propto \frac{\pi^2}{4} - \sqrt{2}\pi\sqrt{z-1} (1 + O(z-1)) + 2(z-1)(1 + O(z-1))$$

01.17.06.0055.01

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

Summed form of the truncated series expansion.

Expansions at $z = -1$

For the function itself

01.17.06.0009.02

$$\csc^{-1}(z) \propto -\frac{\pi}{2} + \sqrt{2}\sqrt{-z-1} \left(1 + \frac{5(z+1)}{12} + \frac{43(z+1)^2}{160} + \dots \right) ; (z \rightarrow -1)$$

01.17.06.0056.01

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

01.17.06.0010.01

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

01.17.06.0011.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + \sqrt{2}\sqrt{-z-1} F_{0 \times 1 \times 1}^{1 \times 1 \times 1} \left(\begin{matrix} \frac{3}{2}; \frac{1}{2}; \frac{1}{2}; \\ ; \frac{3}{2}; \frac{3}{2}; \end{matrix} -1, 1+z \right)$$

01.17.06.0012.02

$$\csc^{-1}(z) \propto -\frac{\pi}{2} + \sqrt{2} \sqrt{-z-1} (1 + O(z+1))$$

01.17.06.0057.01

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

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.17.06.0058.01

$$\csc^{-1}(z)^2 \propto \frac{\pi^2}{4} - \sqrt{2} \pi \sqrt{-z-1} \left(1 + \frac{5(z+1)}{12} + \frac{43(z+1)^2}{160} + \dots \right) - 2(z+1) \left(1 + \frac{5}{6}(z+1) + \frac{32}{45}(z+1)^2 + \dots \right) /; (z \rightarrow -1)$$

01.17.06.0059.01

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

01.17.06.0060.01

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

$$|z+1| < 2$$

01.17.06.0061.01

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

01.17.06.0062.01

$$\csc^{-1}(z)^2 \propto \frac{\pi^2}{4} - \sqrt{2} \pi \sqrt{-z-1} (1 + O(z+1)) - 2(z+1)(1 + O(z+1))$$

01.17.06.0063.01

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

Summed form of the truncated series expansion.

Expansions at $z = \infty$

For the function itself

01.17.06.0013.02

$$\csc^{-1}(z) \propto \frac{1}{z} + \frac{1}{6z^3} + \frac{3}{40z^5} + \dots /; |z| \rightarrow \infty$$

01.17.06.0064.01

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

01.17.06.0014.01

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

01.17.06.0015.01

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

01.17.06.0016.02

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

01.17.06.0065.01

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

Summed form of the truncated series expansion.

For small integer powers of the function

For the second power

01.17.06.0017.02

$$\csc^{-1}(z)^2 \propto \frac{1}{z^2} + \frac{1}{3z^4} + \frac{8}{45z^6} + \dots /; |z| \rightarrow \infty$$

01.17.06.0066.01

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

01.17.06.0018.01

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

01.17.06.0019.01

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

01.17.06.0020.02

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

01.17.06.0067.01

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

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

Summed form of the truncated series expansion.

Residue representations

01.17.06.0021.01

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

01.17.06.0022.01

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

Integral representations

On the real axis

Of the direct function

01.17.07.0001.01

$$\csc^{-1}(z) = \int_{-\infty}^z \frac{1}{t\sqrt{t^2-1}} dt ; \operatorname{Re}(z) < -1$$

01.17.07.0002.01

$$\csc^{-1}(z) = \int_z^{\infty} \frac{1}{t\sqrt{t^2-1}} dt ; \operatorname{Re}(z) > 1$$

01.17.07.0003.01

$$\csc^{-1}(z) = \int_z^{\infty} \frac{1}{z^2 \sqrt{1 - \frac{1}{z^2}}} dz ; z \notin (-1, 1)$$

Contour integral representations

01.17.07.0004.01

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

01.17.07.0005.01

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

01.17.07.0006.01

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

01.17.07.0007.01

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

Continued fraction representations

01.17.10.0001.01

$$\csc^{-1}(z) = \frac{z^{-1} \sqrt{1 - z^{-2}}}{1 - \frac{1 \times 2 z^{-2}}{3 - \frac{1 \times 2 z^{-2}}{5 - \frac{3 \times 4 z^{-2}}{7 - \frac{3 \times 4 z^{-2}}{9 - \frac{5 \times 6 z^{-2}}{11 - \dots}}}}} ; z \notin (-1, 1)$$

01.17.10.0002.01

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

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

01.17.13.0001.01

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

01.17.13.0002.01

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

01.17.13.0003.01

$$\sqrt{1 - \frac{1}{z^2} z^2} z^2 w'(z) = -1 /; w(z) = \csc^{-1}(z) \wedge w(1) = \frac{\pi}{2}$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

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

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

01.17.16.0001.01

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

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

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

01.17.16.0016.01

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

01.17.16.0017.01

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

01.17.16.0006.01

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

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

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

01.17.16.0002.01

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

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

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

01.17.16.0018.01

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

01.17.16.0019.01

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

01.17.16.0020.01

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

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

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

01.17.16.0021.01

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

01.17.16.0022.01

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

01.17.16.0023.01

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

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

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

01.17.16.0024.01

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

01.17.16.0025.01

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

01.17.16.0003.01

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

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

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

01.17.16.0026.01

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

01.17.16.0027.01

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

01.17.16.0028.01

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

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

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

01.17.16.0029.01

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

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

01.17.16.0030.01

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

01.17.16.0031.01

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

01.17.16.0032.01

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

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

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

01.17.16.0033.01

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

01.17.16.0034.01

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

01.17.16.0035.01

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

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

01.17.16.0036.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi}{2} - \csc^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (1, \infty) \wedge z \notin (-\infty, 0)$$

01.17.16.0037.01

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

01.17.16.0038.01

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

01.17.16.0039.01

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

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

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

01.17.16.0040.01

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

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

01.17.16.0041.01

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

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

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

01.17.16.0042.01

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

01.17.16.0043.01

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

01.17.16.0044.01

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

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

01.17.16.0045.01

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

01.17.16.0046.01

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

01.17.16.0047.01

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

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

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

01.17.16.0048.01

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

01.17.16.0049.01

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

01.17.16.0004.01

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

01.17.16.0007.01

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

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

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

01.17.16.0050.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi}{2} - \csc^{-1}(\sqrt{z}) \text{ ; } z \notin (-\infty, 1)$$

01.17.16.0051.01

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

01.17.16.0052.01

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

01.17.16.0053.01

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

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

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

01.17.16.0054.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi}{2} - \csc^{-1}(\sqrt{z}) \quad ; z \notin (-\infty, 1)$$

01.17.16.0055.01

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

01.17.16.0056.01

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

01.17.16.0008.01

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

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

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

01.17.16.0057.01

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

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

01.17.16.0005.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \csc^{-1}(z) + \frac{\pi}{4} \quad ; z \notin (-1, 0)$$

01.17.16.0058.01

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

01.17.16.0059.01

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

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

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

01.17.16.0060.01

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

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

01.17.16.0061.01

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

01.17.16.0062.01

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

01.17.16.0063.01

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

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

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

01.17.16.0064.01

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

01.17.16.0065.01

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

01.17.16.0066.01

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

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

01.17.16.0067.01

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

01.17.16.0068.01

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

01.17.16.0069.01

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

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

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

01.17.16.0070.01

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

01.17.16.0071.01

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

01.17.16.0072.01

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

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

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

01.17.16.0073.01

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

01.17.16.0074.01

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

01.17.16.0075.01

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

01.17.16.0076.01

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

01.17.16.0077.01

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

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

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

01.17.16.0078.01

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

01.17.16.0079.01

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

01.17.16.0080.01

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

01.17.16.0081.01

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

01.17.16.0009.01

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

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

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

01.17.16.0082.01

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

01.17.16.0083.01

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

01.17.16.0084.01

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

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

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

01.17.16.0085.01

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

01.17.16.0086.01

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

01.17.16.0087.01

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

01.17.16.0088.01

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

01.17.16.0089.01

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

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

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

01.17.16.0090.01

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

01.17.16.0091.01

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

01.17.16.0092.01

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

01.17.16.0093.01

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

01.17.16.0094.01

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

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

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

01.17.16.0095.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = 2 \csc^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.16.0096.01

$$\begin{aligned} \csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) &= \frac{\pi \sqrt{1-2z^2} \sqrt{z^4-z^2}}{2\sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \\ &\left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{\sqrt{2}z+1}} \sqrt{\sqrt{2}z+1} + \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-\sqrt{2}z}} \sqrt{1-\sqrt{2}z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}} \right) - \\ &\frac{2\sqrt{1-2z^2} \sqrt{z^4-z^2}}{\sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \csc^{-1}\left(\frac{1}{z}\right) \end{aligned}$$

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

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

01.17.16.0097.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = 2 \csc^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| < \frac{\pi}{2} \vee |z| \geq \sqrt{2} \wedge |\arg(z)| < \frac{\pi}{4}$$

01.17.16.0098.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \frac{2\sqrt{z^2}}{z} \csc^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.16.0099.01

$$\begin{aligned} \csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = & \\ & -\frac{z^3\sqrt{z^2-2}\sqrt{z^2-1}}{2\sqrt{1-z}(z+1)\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{\frac{1}{z}}\sqrt{\frac{z+1}{z}}\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}+\sqrt{\frac{1}{z^2}}z-\right.\right. \\ & \left.\left.\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}\right)-4\csc^{-1}(z)\right) \end{aligned}$$

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

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

01.17.16.0100.01

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

01.17.16.0101.01

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

01.17.16.0102.01

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

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

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

01.17.16.0103.01

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

01.17.16.0104.01

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

01.17.16.0105.01

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

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

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

01.17.16.0106.01

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

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

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

01.17.16.0107.01

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

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

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

01.17.16.0108.01

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

01.17.16.0109.01

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

01.17.16.0110.01

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

01.17.16.0111.01

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

01.17.16.0112.01

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

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

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

01.17.16.0113.01

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

01.17.16.0114.01

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

01.17.16.0115.01

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

01.17.16.0116.01

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

Products, sums, and powers of the direct function

Sums of the direct function

01.17.16.0010.01

$$\csc^{-1}(x) + \csc^{-1}(y) = \operatorname{sgn}\left(\frac{x+y}{xy}\right) \cos^{-1}\left(\sqrt{1-\frac{1}{x^2}} \sqrt{1-\frac{1}{y^2}} - \frac{1}{xy}\right) /; |x| > 1 \vee |y| > 1 \vee xy > 0$$

01.17.16.0011.01

$$\csc^{-1}(x) + \csc^{-1}(y) = -\operatorname{sgn}\left(\frac{x+y}{xy}\right) \cos^{-1}\left(\sqrt{1-\frac{1}{x^2}} \sqrt{1-\frac{1}{y^2}} - \frac{1}{xy}\right) /; 0 < x < 1 \wedge -1 < y < 0 \vee -1 < x < 0 \wedge 0 < y < 1$$

01.17.16.0012.01

$$\csc^{-1}(x) + \csc^{-1}(y) = \sin^{-1}\left(\frac{1}{y} \sqrt{1-\frac{1}{x^2}} + \frac{1}{x} \sqrt{1-\frac{1}{y^2}}\right) /; xy < 0 \vee \frac{1}{x^2} + \frac{1}{y^2} \leq 1$$

01.17.16.0013.01

$$\csc^{-1}(x) + \csc^{-1}(y) = \operatorname{sgn}(x) \pi - \sin^{-1}\left(\frac{1}{y} \sqrt{1-\frac{1}{x^2}} + \frac{1}{x} \sqrt{1-\frac{1}{y^2}}\right) /; xy > 0 \wedge \frac{1}{x^2} + \frac{1}{y^2} > 1$$

01.17.16.0117.01

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

01.17.16.0118.01

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

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

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

Differences of the direct function

01.17.16.0014.01

$$\csc^{-1}(x) - \csc^{-1}(y) = \sin^{-1} \left(\frac{1}{x} \sqrt{1-\frac{1}{y^2}} - \frac{1}{y} \sqrt{1-\frac{1}{x^2}} \right) /; xy > 0 \vee \frac{1}{x^2} + \frac{1}{y^2} \leq 1$$

01.17.16.0015.01

$$\csc^{-1}(x) - \csc^{-1}(y) = \operatorname{sgn}(x) \pi - \sin^{-1} \left(\frac{\sqrt{1-\frac{1}{y^2}}}{x} - \frac{\sqrt{1-\frac{1}{x^2}}}{y} \right) /; xy < 0 \wedge \frac{1}{x^2} + \frac{1}{y^2} > 1$$

01.17.16.0119.01

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

01.17.16.0120.01

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

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

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

Linear combinations of the direct function

01.17.16.0121.01

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

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

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

01.17.16.0122.01

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

Related transformations

Sums involving the direct function

Involving log(z)

01.17.16.0123.01

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

01.17.16.0124.01

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

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

01.17.16.0125.01

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

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

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

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

01.17.16.0126.01

$$\csc^{-1}(x) + \sin^{-1}(y) =$$

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

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

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

01.17.16.0127.01

$$\csc^{-1}(x) + \cos^{-1}(y) = -\frac{\frac{y}{x} + \sqrt{1 - \frac{1}{x^2}} \sqrt{1 - y^2}}{\sqrt{\left(\frac{y}{x} + \sqrt{1 - \frac{1}{x^2}} \sqrt{1 - y^2}\right)^2}} \sin^{-1}\left(\sqrt{1 - \frac{1}{x^2}} y - \frac{\sqrt{1 - y^2}}{x}\right) +$$

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

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

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

01.17.16.0128.01

$$\csc^{-1}(x) + \cos^{-1}(y) =$$

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

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

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

01.17.16.0129.01

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

01.17.16.0130.01

$\csc^{-1}(x) + \tan^{-1}(y) =$

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

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

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

01.17.16.0131.01

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

01.17.16.0132.01

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

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

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

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

01.17.16.0133.01

$$\csc^{-1}(x) + \sec^{-1}(y) =$$

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

01.17.16.0134.01

$$\csc^{-1}(x) + \sec^{-1}(y) =$$

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

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

01.17.16.0135.01

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

01.17.16.0136.01

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

01.17.16.0137.01

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

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

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

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

01.17.16.0138.01

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

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

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

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

01.17.16.0139.01

$$\csc^{-1}(x) + \cosh^{-1}(y) =$$

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

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

01.17.16.0140.01

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

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

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

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

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

01.17.16.0141.01

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

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

01.17.16.0142.01

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

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

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

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

01.17.16.0143.01

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

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

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

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

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

01.17.16.0144.01

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

01.17.16.0145.01

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

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

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

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

01.17.16.0146.01

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

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

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

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

01.17.16.0147.01

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

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

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

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

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

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

01.17.16.0148.01

$$\csc^{-1}(x) + i \coth^{-1}(y) = \frac{\pi \left(\frac{i \sqrt{1 - \frac{1}{x^2}} x}{y} + 1 \right)}{2x \sqrt{1 - \frac{1}{y^2}} \sqrt{\frac{\left(\sqrt{1 - \frac{1}{x^2}} x - iy \right)^2}{x^2(1-y^2)}}} + \frac{\left(ix \sqrt{1 - \frac{1}{y^2}} y \sqrt{\frac{x^2 - 2i \sqrt{1 - \frac{1}{x^2}} yx - y^2 - 1}{x^2(1-y^2)}} \right) \sin^{-1} \left(\frac{\sqrt{1 - \frac{1}{x^2}} x - \frac{i}{y}}{x \sqrt{1 - \frac{1}{y^2}}} \right)}{\sqrt{1 - \frac{1}{x^2}} x - iy} +$$

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

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

01.17.16.0149.01

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

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

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

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

01.17.16.0150.01

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

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

01.17.16.0151.01

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

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

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

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

01.17.16.0152.01

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

01.17.16.0153.01

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

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

01.17.16.0154.01

$$\csc^{-1}(x) + \operatorname{sech}^{-1}(y) =$$

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

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

01.17.16.0155.01

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

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

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

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

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

01.17.16.0157.01

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

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

01.17.16.0158.01

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

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

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

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

01.17.16.0159.01

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

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

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

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

01.17.16.0160.01

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

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

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

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

01.17.16.0161.01

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

01.17.16.0162.01

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

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

01.17.16.0163.01

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

01.17.16.0164.01

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

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

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

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

01.17.16.0165.01

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

01.17.16.0166.01

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

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

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

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

01.17.16.0167.01

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

01.17.16.0168.01

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

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

01.17.16.0169.01

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

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

01.17.16.0170.01

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

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

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

01.17.16.0171.01

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

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

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

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

01.17.16.0172.01

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

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

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

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

01.17.16.0173.01

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

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

01.17.16.0174.01

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

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

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

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

01.17.16.0175.01

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

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

01.17.16.0176.01

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

01.17.16.0177.01

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

01.17.16.0178.01

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

01.17.16.0179.01

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

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

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

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

01.17.16.0180.01

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

01.17.16.0181.01

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

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

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

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

01.17.16.0182.01

$$\csc^{-1}(x) - i \coth^{-1}(y) = \frac{\pi \left(1 - \frac{i \sqrt{1 - \frac{1}{x^2}} x}{y} \right)}{2x \sqrt{1 - \frac{1}{y^2}} \sqrt{\frac{\left(\sqrt{1 - \frac{1}{x^2}} x + iy \right)^2}{x^2(1-y^2)}}} - \frac{ix \sqrt{1 - \frac{1}{y^2}} y \sqrt{\frac{x^2 + 2i \sqrt{1 - \frac{1}{x^2}} yx - y^2 - 1}{x^2(1-y^2)}}}{\sqrt{1 - \frac{1}{x^2}} x + iy} \sin^{-1} \left(\frac{\sqrt{1 - \frac{1}{x^2}} x + \frac{i}{y}}{x \sqrt{1 - \frac{1}{y^2}}} \right) +$$

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

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

01.17.16.0183.01

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

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

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

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

01.17.16.0184.01

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

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

01.17.16.0185.01

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

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

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

01.17.16.0186.01

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

01.17.16.0187.01

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

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

01.17.16.0188.01

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

01.17.16.0189.01

$$\csc^{-1}(x) - \operatorname{sech}^{-1}(y) =$$

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

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

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

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

01.17.16.0190.01

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

Linear combinations involving the direct function

Involving log(z)

01.17.16.0191.01

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

01.17.16.0192.01

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

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

01.17.16.0193.01

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

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

01.17.16.0194.01

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

$$\begin{aligned} & -2i\pi \left(\frac{-\arg \left(\left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} \right) - \arg \left((iy + \sqrt{1 - y^2})^{-ib} \right) + \pi}{2\pi} \right) + \left(\frac{\operatorname{Re} \left(a \log \left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right) \right) + \pi}{2\pi} \right) + \\ & \left(\frac{\operatorname{Re} \left(b \log (iy + \sqrt{1 - y^2}) \right) + \pi}{2\pi} \right) + i \left(1 - (-1)^{\left\lfloor \frac{\arg \left((iy + \sqrt{1 - y^2})^{-ib} \left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} + 1 \right)}{2\pi} \right\rfloor \left\lfloor \frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} (iy + \sqrt{1 - y^2})^{-ib} \right)}{2\pi} \right\rfloor \right) \pi + \\ & i(-1)^{\left\lfloor \frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} (iy + \sqrt{1 - y^2})^{-ib} \right)}{\pi} \right\rfloor} \left(\frac{\arg \left(\left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} (iy + \sqrt{1 - y^2})^{-ib} - 1 \right)}{2\pi} + \frac{1}{2} - \frac{\arg \left((iy + \sqrt{1 - y^2})^{-ib} \left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} + 1 \right)}{2\pi} \right) \\ & \left(\csc^{-1} \left(\frac{2 \left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-ia} (iy + \sqrt{1 - y^2})^{-ib}}{(iy + \sqrt{1 - y^2})^{-2ib} \left(\sqrt{1 - \frac{1}{x^2}} + \frac{i}{x} \right)^{-2ia} + 1} \right) - \frac{\pi}{2} \right) \end{aligned}$$

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

01.17.16.0195.01

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

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

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

01.17.16.0196.01

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

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

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

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

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

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

01.17.16.0197.01

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

01.17.16.0198.01

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

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

01.17.16.0199.01

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

01.17.16.0200.01

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

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

01.17.16.0201.01

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

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

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

01.17.16.0202.01

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

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

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

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

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

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

01.17.16.0203.01

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

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

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

01.17.16.0204.01

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

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

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

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

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

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

01.17.16.0205.01

$$a \csc^{-1}(x) + b \cosh^{-1}(y) =$$

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

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

01.17.16.0206.01

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

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

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

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

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

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

01.17.16.0207.01

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

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

01.17.16.0208.01

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

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

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

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

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

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

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

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

01.17.16.0209.01

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

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

01.17.16.0210.01

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

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

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

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

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

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

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

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

01.17.16.0211.01

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

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

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

01.17.16.0212.01

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

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

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

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

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

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

01.17.16.0213.01

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

01.17.16.0214.01

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

Identities

Functional identities

01.17.17.0001.01

$$(z_1^2 - z_2^2)^2 \csc^4(w(z_1) + w(z_2)) - 2z_1^2 z_2^2 (z_1^2 + z_2^2 - 2) \csc^2(w(z_1) + w(z_2)) + z_1^4 z_2^4 = 0 \text{ ; } w(z) = \csc^{-1}(z)$$

Complex characteristics

Real part

01.17.19.0001.01

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

Imaginary part

01.17.19.0002.01

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

Absolute value

01.17.19.0003.01

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

Argument

01.17.19.0004.01

$$\arg(\csc^{-1}(x + i y)) = \tan^{-1} \left[\tan^{-1} \left(\frac{(x^2 + y^2) \cos\left(\frac{1}{2} \tan^{-1}\left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2xy}{(x^2 + y^2)^2}\right)\right) \sqrt{\frac{x^4 + 2(y^2 - 1)x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + y}{x^2 + y^2} \right), \right.$$

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

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

Conjugate value

01.17.19.0005.01

$$\overline{\csc^{-1}(x + i y)} = \tan^{-1} \left[\frac{(x^2 + y^2) \cos\left(\frac{1}{2} \tan^{-1}\left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2xy}{(x^2 + y^2)^2}\right)\right) \sqrt{\frac{x^4 + 2(y^2 - 1)x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + y}{x^2 + y^2} \right),$$

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

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

Signum value

01.17.19.0006.01

$$\begin{aligned} \operatorname{sgn}(\operatorname{csc}^{-1}(x + i y)) = & \left(\tan^{-1} \left(\frac{1}{x^2 + y^2} \left((x^2 + y^2) \cos \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + y \right) \right. \\ & \left. \frac{1}{x^2 + y^2} \left((x^2 + y^2) \sin \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + x \right) \right) - \\ & i \log \left(\sqrt{\left(\left(\cos \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + \frac{y}{x^2 + y^2} \right)^2 \right. \right. \\ & \left. \left. \left(\sin \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\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(\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{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + y \right) \right) \right. \right. \\ & \left. \left. \frac{1}{x^2 + y^2} \left((x^2 + y^2) \sin \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + x \right) \right) \right)^2 + \\ & \log^2 \left(\sqrt{\left(\left(\cos \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\frac{x^4 + 2 (y^2 - 1) x^2 + (y^2 + 1)^2}{(x^2 + y^2)^2}} + \frac{y}{x^2 + y^2} \right)^2 \right. \right. \\ & \left. \left. \left(\sin \left(\frac{1}{2} \tan^{-1} \left(\frac{y^2 - x^2}{(x^2 + y^2)^2} + 1, \frac{2 x y}{(x^2 + y^2)^2} \right) \right) \sqrt{\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) \right) \end{aligned}$$

Differentiation

Low-order differentiation

01.17.20.0001.01

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

01.17.20.0002.01

$$\frac{\partial^2 \csc^{-1}(z)}{\partial z^2} = \frac{2z^2 - 1}{\sqrt{1 - \frac{1}{z^2}} z^3 (z^2 - 1)}$$

Symbolic differentiation

01.17.20.0005.01

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

01.17.20.0003.02

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

Fractional integro-differentiation

01.17.20.0004.01

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

Integration

Indefinite integration

For the direct function itself

01.17.21.0001.01

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

01.17.21.0002.01

$$\int \frac{\csc^{-1}(z)}{z} dz = \frac{1}{2} i \left(\csc^{-1}(z)^2 + \text{Li}_2\left(e^{2i \csc^{-1}(z)}\right)\right) - \csc^{-1}(z) \log\left(1 - e^{2i \csc^{-1}(z)}\right)$$

01.17.21.0003.01

$$\int \frac{\csc^{-1}(z)}{\sqrt{z}} dz = 2 \csc^{-1}(z) \sqrt{z} + \frac{4 \sqrt{z^2 - z^4}}{\sqrt{-z^2} \sqrt{z^2 - 1}} F\left(\frac{\sqrt{-z} \sinh^{-1}(\sqrt{z})}{\sqrt{z}} \middle| -1\right)$$

01.17.21.0004.01

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

01.17.21.0005.01

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

01.17.21.0006.01

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

01.17.21.0007.01

$$\int \frac{\csc^{-1}(az + b)}{z} dz = \frac{1}{8} \left(i(\pi - 2 \csc^{-1}(b + az))^2 + 4 \log \left(-\frac{az}{b + az} \right) (\pi - 2 \csc^{-1}(b + az)) + 32 i \sin^{-1} \left(\frac{1}{\sqrt{2}} \sqrt{1 - \frac{1}{b}} \right) \tan^{-1} \left(\frac{b + 1}{\sqrt{1 - b^2}} \tan \left(\frac{1}{4} (\pi - 2 \csc^{-1}(b + az)) \right) \right) - 8 \csc^{-1}(b + az) \log \left(1 - e^{2i \csc^{-1}(b + az)} \right) - 4 \left(-2 \csc^{-1}(b + az) - 4 \sin^{-1} \left(\frac{1}{\sqrt{2}} \sqrt{1 - \frac{1}{b}} \right) + \pi \right) \log \left(1 + \frac{i(\sqrt{1 - b^2} - 1)}{b e^{i \csc^{-1}(b + az)}} \right) - 4 \left(-2 \csc^{-1}(b + az) + 4 \sin^{-1} \left(\frac{1}{\sqrt{2}} \sqrt{1 - \frac{1}{b}} \right) + \pi \right) \log \left(1 - \frac{i(\sqrt{1 - b^2} + 1)}{b e^{i \csc^{-1}(b + az)}} \right) + 8 \csc^{-1}(b + az) \log \left(-\frac{az}{b + az} \right) + 4 i \left(\csc^{-1}(b + az)^2 + \text{Li}_2 \left(e^{2i \csc^{-1}(b + az)} \right) \right) + 8 i \left(\text{Li}_2 \left(\frac{i(\sqrt{1 - b^2} + 1)}{b e^{i \csc^{-1}(b + az)}} \right) + \text{Li}_2 \left(-\frac{i(\sqrt{1 - b^2} - 1)}{b e^{i \csc^{-1}(b + az)}} \right) \right) \right)$$

Definite integration

For the direct function itself

01.17.21.0008.01

$$\int_0^1 t^a \csc^{-1}(t) dt = \frac{\pi}{2a + 2} \quad ; \text{Re}(a) > 0$$

01.17.21.0009.01

$$\int_1^\infty \frac{\csc^{-1}(t)}{\sqrt{t}} dt = \frac{\sqrt{\pi} \Gamma\left(\frac{1}{4}\right)}{\Gamma\left(\frac{3}{4}\right)} - \pi$$

Involving the direct function

01.17.21.0010.01

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

Representations through more general functions

Through hypergeometric functions

Involving ${}_2F_1$

01.17.26.0038.01

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

01.17.26.0039.01

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

01.17.26.0040.01

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

01.17.26.0041.01

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

01.17.26.0001.01

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

Involving ${}_pF_q$

01.17.26.0002.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{-\frac{1}{z^2}} z \left(-\log\left(-\frac{4}{z^2}\right) + \frac{1}{2} z^2 {}_3F_2\left(\frac{3}{2}, 1, 1; 2, 2; z^2\right) \right); z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.26.0003.01

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

Through hypergeometric functions of two variables

01.17.26.0004.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \sqrt{2} \sqrt{z-1} F_{0 \times 1 \times 1}^{1 \times 1 \times 1} \left(\begin{matrix} \frac{3}{2}, \frac{1}{2}, \frac{1}{2} \\ \frac{3}{2}, \frac{3}{2} \end{matrix}; -1, 1-z \right)$$

01.17.26.0005.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + \sqrt{2} \sqrt{-z-1} F_{0 \times 1 \times 1}^{1 \times 1 \times 1} \left(\begin{matrix} \frac{3}{2}, \frac{1}{2}, \frac{1}{2} \\ \frac{3}{2}, \frac{3}{2} \end{matrix}; -1, 1+z \right)$$

Through Meijer G

Classical cases for the direct function itself

01.17.26.0006.01

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

01.17.26.0007.01

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

01.17.26.0008.01

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

01.17.26.0009.01

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

01.17.26.0034.01

$$\begin{aligned} \csc^{-1}(\sqrt{z}) + \frac{1}{2}\sqrt{z}\sqrt{-\frac{1}{z}}\log\left(-\frac{4}{z}\right) - \frac{1}{2}\sqrt{z}\sqrt{-\frac{1}{z}}\sum_{k=1}^n \frac{\left(\frac{1}{2}\right)_k z^k}{kk!} = \\ \frac{(-1)^{n-1}\sqrt{z}}{2\sqrt{\pi}}\sqrt{-\frac{1}{z}}G_{3,3}^{1,3}\left(-z \left| \begin{matrix} \frac{1}{2}, 1, n+1 \\ n+1, 0, 0 \end{matrix} \right.\right); n \in \mathbb{N} \wedge z \notin (0, 1) \end{aligned}$$

01.17.26.0035.01

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

Classical cases involving algebraic functions

01.17.26.0010.01

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

01.17.26.0011.01

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

Classical cases involving θ

01.17.26.0012.01

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

01.17.26.0013.01

$$\theta(1 - |z|) \operatorname{csc}^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} G_{1,1}^{1,0}\left(z \left| \begin{matrix} 1 \\ 0 \end{matrix} \right. \right) - \frac{\sqrt{\pi}}{2} G_{2,2}^{2,0}\left(z \left| \begin{matrix} 1, 1 \\ 0, \frac{1}{2} \end{matrix} \right. \right); z \notin (-1, 0)$$

Classical cases for powers of csc^{-1}

01.17.26.0014.01

$$\operatorname{csc}^{-1}(\sqrt{z})^2 = -\frac{\sqrt{\pi}}{2} G_{3,3}^{3,1}\left(-z \left| \begin{matrix} 0, 1, \frac{1}{2} \\ 0, 0, 0 \end{matrix} \right. \right)$$

Generalized cases for the direct function itself

01.17.26.0015.01

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

01.17.26.0016.01

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

01.17.26.0036.01

$$\operatorname{csc}^{-1}(z) + \frac{1}{2}z \sqrt{-\frac{1}{z^2}} \log\left(-\frac{4}{z^2}\right) - \frac{1}{2}z \sqrt{-\frac{1}{z^2}} \sum_{k=1}^n \frac{\left(\frac{1}{2}\right)_k z^{2k}}{k k!} = \frac{(-1)^{n-1} z}{2\sqrt{\pi}} \sqrt{-\frac{1}{z^2}} G_{3,3}^{1,3}\left(iz, \frac{1}{2} \left| \begin{matrix} \frac{1}{2}, 1, n+1 \\ n+1, 0, 0 \end{matrix} \right. \right);$$

$$n \in \mathbb{N} \wedge z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.26.0037.01

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

Generalized cases involving algebraic functions

01.17.26.0017.01

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

01.17.26.0018.01

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

01.17.26.0019.01

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

Generalized cases involving θ

01.17.26.0020.01

$$\theta(|z| - 1) \operatorname{csc}^{-1}(z) = \frac{\pi}{2} G_{1,1}^{0,1}\left(z, \frac{1}{2} \middle| \frac{1}{0}\right) - \frac{1}{2} \sqrt{\pi} G_{2,2}^{0,2}\left(z, \frac{1}{2} \middle| \frac{1, \frac{1}{2}}{0, 0}\right)$$

01.17.26.0021.01

$$\theta(1 - |z|) \operatorname{csc}^{-1}\left(\frac{1}{z}\right) = \frac{1}{2} \pi G_{1,1}^{1,0}\left(z, \frac{1}{2} \middle| \frac{1}{0}\right) - \frac{1}{2} \sqrt{\pi} G_{2,2}^{2,0}\left(z, \frac{1}{2} \middle| \frac{1, 1}{0, \frac{1}{2}}\right)$$

Generalized cases for powers of csc^{-1}

01.17.26.0022.01

$$\operatorname{csc}^{-1}(z)^2 = -\frac{1}{2} \sqrt{\pi} G_{3,3}^{3,1}\left(i z, \frac{1}{2} \middle| \frac{0, 1, \frac{1}{2}}{0, 0, 0}\right)$$

Through other functions

Involving inverse Jacobi functions

01.17.26.0023.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - \operatorname{cd}^{-1}\left(\frac{1}{z} \middle| 0\right)$$

01.17.26.0024.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - \operatorname{cn}^{-1}\left(\frac{1}{z} \middle| 0\right)$$

01.17.26.0025.01

$$\operatorname{csc}^{-1}(z) = i \operatorname{cs}^{-1}(i z | 1)$$

01.17.26.0026.01

$$\operatorname{csc}^{-1}(z) = \operatorname{ds}^{-1}(z | 0)$$

01.17.26.0027.01

$$\operatorname{csc}^{-1}(z) = i \operatorname{ds}^{-1}(i z | 1)$$

01.17.26.0028.01

$$\operatorname{csc}^{-1}(z) = \operatorname{ns}^{-1}(z | 0)$$

01.17.26.0029.01

$$\operatorname{csc}^{-1}(z) = -i \operatorname{sc}^{-1}\left(\frac{i}{z} \middle| 1\right)$$

01.17.26.0030.01

$$\operatorname{csc}^{-1}(z) = -i \operatorname{sd}^{-1}\left(\frac{i}{z} \middle| 1\right)$$

01.17.26.0031.01

$$\operatorname{csc}^{-1}(z) = \operatorname{sd}^{-1}\left(\frac{1}{z} \middle| 0\right)$$

01.17.26.0032.01

$$\operatorname{csc}^{-1}(z) = \operatorname{sn}^{-1}\left(\frac{1}{z} \middle| 0\right)$$

Involving some hypergeometric-type functions

01.17.26.0033.01

$$\csc^{-1}(z) = \frac{z}{2} \sqrt{\frac{1}{z^2}} \operatorname{B}_{\frac{1}{z^2}}\left(\frac{1}{2}, \frac{1}{2}\right)$$

Representations through equivalent functions

With inverse function

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

01.17.27.0001.01

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

01.17.27.0002.01

$$\csc^{-1}(\csc(z)) = -\pi - z /; -\frac{3\pi}{2} < \operatorname{Re}[z] < -\frac{\pi}{2} \vee \left(\operatorname{Re}(z) = -\frac{3\pi}{2} \wedge \operatorname{Im}(z) \geq 0 \right) \vee \left(\operatorname{Re}(z) = -\frac{\pi}{2} \wedge \operatorname{Im}(z) \leq 0 \right)$$

01.17.27.0003.01

$$\csc^{-1}(\csc(z)) = \pi - z /; \frac{\pi}{2} < \operatorname{Re}(z) < \frac{3\pi}{2} \vee \left(\operatorname{Re}(z) = \frac{\pi}{2} \wedge \operatorname{Im}(z) \geq 0 \right) \vee \left(\operatorname{Re}(z) = \frac{3\pi}{2} \wedge \operatorname{Im}(z) \leq 0 \right)$$

01.17.27.0004.01

$$\csc^{-1}(\csc(z)) = (-1)^k (z - \pi k) /; \left(k\pi - \frac{\pi}{2} < \operatorname{Re}(z) < k\pi + \frac{\pi}{2} \vee \left(\operatorname{Re}(z) = k\pi - \frac{\pi}{2} \wedge \operatorname{Im}(z) \geq 0 \right) \vee \left(\operatorname{Re}(z) = k\pi + \frac{\pi}{2} \wedge \operatorname{Im}(z) \leq 0 \right) \right) \wedge k \in \mathbb{Z}$$

01.17.27.0005.01

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

01.17.27.2399.01

$$\csc^{-1}(\csc(z)) = \begin{cases} (-1)^{\lfloor \frac{2\operatorname{Re}(z)+\pi}{2\pi} \rfloor} \left(\pi \left[\frac{2\operatorname{Re}(z)-\pi}{2\pi} \right] - z \right) & \frac{2\operatorname{Re}(z)+\pi}{2\pi} \in \mathbb{Z} \wedge \operatorname{Im}(z) \leq 0 \\ (-1)^{\lfloor \frac{2\operatorname{Re}(z)+\pi}{2\pi} \rfloor} \left(z - \pi \left[\frac{2\operatorname{Re}(z)+\pi}{2\pi} \right] \right) & \text{True} \end{cases}$$

01.17.27.2400.01

$$\csc^{-1}(\csc(z)) = \sin^{-1}(\sin(z))$$

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

01.17.27.0006.01

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

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

01.17.27.2401.01

$$\csc^{-1}(\sec(z)) = \frac{\pi}{2} - z /; 0 < \operatorname{Re}(z) < \pi \vee (\operatorname{Re}(z) = \pi \wedge \operatorname{Im}(z) \leq 0) \vee (\operatorname{Re}(z) = 0 \wedge \operatorname{Im}(z) \geq 0)$$

01.17.27.2402.01

$$\csc^{-1}(\sec(z)) = z + \frac{\pi}{2} /; -\pi < \operatorname{Re}(z) < 0 \vee (\operatorname{Re}(z) = 0 \wedge \operatorname{Im}(z) \leq 0) \vee (\operatorname{Re}(z) = -\pi \wedge \operatorname{Im}(z) \geq 0)$$

01.17.27.2403.01

$$\csc^{-1}(\sec(z)) = (-1)^k \left(\pi k + \frac{\pi}{2} - z \right) /;$$

$$(k\pi < \operatorname{Re}(z) < \pi + k\pi \vee (\operatorname{Re}(z) = \pi + k\pi \wedge \operatorname{Im}(z) \leq 0) \vee (\operatorname{Re}(z) = k\pi \wedge \operatorname{Im}(z) \geq 0)) \wedge k \in \mathbb{Z}$$

01.17.27.2404.01

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

01.17.27.2405.01

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

01.17.27.2406.01

$$\csc^{-1}(\sec(z)) = \sin^{-1}(\cos(z))$$

With related functions

Involving log

01.17.27.0007.01

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

Involving \sin^{-1}

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

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

01.17.27.0008.01

$$\csc^{-1}(z) = \sin^{-1}\left(\frac{1}{z}\right)$$

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

01.17.27.0061.01

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

01.17.27.0062.01

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

01.17.27.0063.01

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

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

01.17.27.0064.01

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

01.17.27.0065.01

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

01.17.27.0066.01

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

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

01.17.27.0067.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2 \sin^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{2z}} \right); z \notin (-1, 0)$$

01.17.27.0068.01

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

01.17.27.0069.01

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

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

01.17.27.0070.01

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

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

01.17.27.0071.01

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

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

01.17.27.0072.01

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

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

01.17.27.0073.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sin^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-2z}} \right); z \notin (0, 1)$$

01.17.27.0074.01

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

01.17.27.0075.01

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

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

01.17.27.0076.01

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

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

01.17.27.0077.01

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

01.17.27.0078.01

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

01.17.27.0079.01

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

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

01.17.27.0080.01

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

01.17.27.0081.01

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

01.17.27.0082.01

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

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

01.17.27.0083.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \sin^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); \operatorname{Re}(z) > 0$$

01.17.27.0084.01

$$\csc^{-1}(z) = -\sin^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) - \frac{\pi}{2}; \operatorname{Re}(z) < 0$$

01.17.27.0085.01

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

01.17.27.0086.01

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

01.17.27.0087.01

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

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

01.17.27.0088.01

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

01.17.27.0089.01

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

01.17.27.0090.01

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

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

01.17.27.0091.01

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

01.17.27.0092.01

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

01.17.27.0093.01

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

01.17.27.0094.01

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

01.17.27.0095.01

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

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

01.17.27.0096.01

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

01.17.27.0097.01

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

01.17.27.0098.01

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

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

01.17.27.0099.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{2z} \sin^{-1}\left(\frac{2\sqrt{-1+z^2}}{z^2}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0100.01

$$\begin{aligned} \csc^{-1}(z) = & \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{z}{\sqrt{\frac{1-z^2}{z^2}}} \sqrt{\frac{1-z^2}{z^4}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \right. \\ & \left. \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-1}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \sin^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2}\right) \right) \end{aligned}$$

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

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

01.17.27.0101.01

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

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

01.17.27.0102.01

$$\csc^{-1}(\sqrt{z}) = \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-\infty, 0)$$

01.17.27.0103.01

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

01.17.27.0104.01

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

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

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

01.17.27.0105.01

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

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

01.17.27.0106.01

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

01.17.27.0107.01

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

01.17.27.0108.01

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

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

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

01.17.27.0109.01

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

01.17.27.0110.01

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

01.17.27.0111.01

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

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

Involving $\csc^{-1}(a(bz^c)^m)$ and $\sin^{-1}\left(\frac{1}{a}b^{-m}z^{-mc}\right)$

01.17.27.0112.01

$$\csc^{-1}(a(bz^c)^m) = \frac{(bz^c)^m}{b^m z^{mc}} \sin^{-1}\left(\frac{1}{a}b^{-m}z^{-mc}\right) /; 2m \in \mathbb{Z}$$

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

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

01.17.27.0113.01

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

01.17.27.0114.01

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

01.17.27.0115.01

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

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

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

01.17.27.0116.01

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

01.17.27.0117.01

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

01.17.27.0118.01

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

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

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

01.17.27.0119.01

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

01.17.27.0120.01

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

01.17.27.0121.01

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

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

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

01.17.27.0122.01

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

01.17.27.0123.01

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

01.17.27.0124.01

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

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

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

01.17.27.0125.01

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

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

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

01.17.27.0126.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi}{2} - \sin^{-1}(\sqrt{z}) ; z \notin (1, \infty)$$

01.17.27.0127.01

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

01.17.27.0128.01

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

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

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

01.17.27.0129.01

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

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

01.17.27.0130.01

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

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

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

01.17.27.0131.01

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

01.17.27.0132.01

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

01.17.27.0133.01

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

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

01.17.27.0134.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{\pi}{4} - \frac{1}{2} \sin^{-1}(z); z \notin (1, \infty)$$

01.17.27.0135.01

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

01.17.27.0136.01

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

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

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

01.17.27.0137.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi}{2} - \sin^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, 0)$$

01.17.27.0138.01

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

01.17.27.0139.01

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

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

01.17.27.0140.01

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

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

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

01.17.27.0141.01

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

01.17.27.0142.01

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

01.17.27.0143.01

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

01.17.27.0144.01

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

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

01.17.27.0145.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi}{2} - \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (0, 1)$$

01.17.27.0146.01

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

01.17.27.0147.01

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

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

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

01.17.27.0148.01

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

01.17.27.0149.01

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

01.17.27.0150.01

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

01.17.27.0151.01

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

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

01.17.27.0152.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi}{2} - \sin^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (0, 1)$$

01.17.27.0153.01

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

01.17.27.0154.01

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

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

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

01.17.27.0155.01

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

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

01.17.27.0156.01

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

01.17.27.0157.01

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

01.17.27.0158.01

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

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

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

01.17.27.0159.01

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

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

01.17.27.0160.01

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

01.17.27.0161.01

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

01.17.27.0162.01

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

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

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

01.17.27.0163.01

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

01.17.27.0164.01

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

01.17.27.0165.01

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

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

01.17.27.0166.01

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

01.17.27.0167.01

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

01.17.27.0168.01

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

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

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

01.17.27.0169.01

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

01.17.27.0170.01

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

01.17.27.0010.01

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

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

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

01.17.27.0171.01

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

01.17.27.0172.01

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

01.17.27.0173.01

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

01.17.27.0174.01

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

01.17.27.0175.01

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

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

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

01.17.27.0176.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} - \sin^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0$$

01.17.27.0177.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0$$

01.17.27.0178.01

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

01.17.27.0179.01

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

01.17.27.0180.01

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

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

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

01.17.27.0181.01

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

01.17.27.0182.01

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

01.17.27.0183.01

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

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

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

01.17.27.0184.01

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

01.17.27.0185.01

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

01.17.27.0186.01

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

01.17.27.0187.01

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

01.17.27.0188.01

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

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

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

01.17.27.0189.01

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

01.17.27.0190.01

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

01.17.27.0191.01

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

01.17.27.0192.01

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

01.17.27.0193.01

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

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

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

01.17.27.0194.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = 2 \sin^{-1}(z); \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.27.0195.01

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

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

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

01.17.27.0196.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = 2 \sin^{-1}\left(\frac{1}{z}\right); \frac{\pi}{4} \leq \arg(z) < \frac{\pi}{2} \vee |z| \geq \sqrt{2} \wedge |\arg(z)| < \frac{\pi}{4}$$

01.17.27.0197.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \frac{2\sqrt{z^2}}{z} \sin^{-1}\left(\frac{1}{z}\right); \frac{\pi}{4} \leq \arg(z) \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0198.01

$$\begin{aligned} \csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = & -\frac{z^3 \sqrt{z^2-2} \sqrt{z^2-1}}{2\sqrt{1-z}(z+1)\sqrt{-z^4+3z^2-2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{\frac{1}{z}} \sqrt{\frac{z+1}{z}} \left(\pi \left(\frac{z^3}{1-z^2} \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}} z - \right. \right. \\ & \left. \left. \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - 4 \sin^{-1}\left(\frac{1}{z}\right) \right) \end{aligned}$$

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

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

01.17.27.0199.01

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

01.17.27.0200.01

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

01.17.27.0201.01

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

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

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

01.17.27.0202.01

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

01.17.27.0203.01

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

01.17.27.0204.01

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

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

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

01.17.27.0205.01

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

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

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

01.17.27.0206.01

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

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

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

01.17.27.0207.01

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

01.17.27.0208.01

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

01.17.27.0209.01

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

01.17.27.0210.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{\pi}{2} - \frac{1}{2}\sin^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0211.01

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

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

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

01.17.27.0212.01

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

01.17.27.0213.01

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

01.17.27.0214.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{\pi}{2} - \frac{1}{2} \sin^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0215.01

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

Involving \cos^{-1}

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

Involving $\operatorname{csc}^{-1}(z)$ and $\cos^{-1}(1/z)$

01.17.27.0216.01

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

Involving $\operatorname{csc}^{-1}(z)$ and $\cos^{-1}(-1/z)$

01.17.27.0217.01

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

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

01.17.27.0218.01

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

01.17.27.0219.01

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

01.17.27.0220.01

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

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

01.17.27.0221.01

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

01.17.27.0222.01

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

01.17.27.0223.01

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

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

01.17.27.0224.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - 2 \cos^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right) /; z \notin (-1, 0)$$

01.17.27.0225.01

$$\operatorname{csc}^{-1}(z) = -\frac{3\pi}{2} + 2 \cos^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0226.01

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

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-2z}}\right)$

01.17.27.0227.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \cos^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-2z}}\right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z+1}{2z}}\right)$

01.17.27.0228.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \cos^{-1}\left(\sqrt{\frac{z+1}{2z}}\right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right)$

01.17.27.0229.01

$$\csc^{-1}(z) = 2 \cos^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right)$

01.17.27.0230.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2 \cos^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right) ; z \notin (0, 1)$$

01.17.27.0231.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2 \cos^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0232.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right)\right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z-1}{2z}}\right)$

01.17.27.0233.01

$$\csc^{-1}(z) = 2 \cos^{-1}\left(\sqrt{\frac{z-1}{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z^2}}\right)$

01.17.27.0234.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{z^2}}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0235.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{1}{\sqrt{z^2}}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0236.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{z^2}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z^2}}\right)$

01.17.27.0237.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \cos^{-1}\left(\sqrt{\frac{1}{z^2}}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0238.01

$$\csc^{-1}(z) = \cos^{-1}\left(\sqrt{\frac{1}{z^2}}\right) - \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0239.01

$$\csc^{-1}(z) = z \sqrt{\frac{1}{z^2}} \left(\frac{\pi}{2} - \cos^{-1}\left(\sqrt{\frac{1}{z^2}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

01.17.27.0240.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); \operatorname{Re}(z) > 0$$

01.17.27.0241.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) - \pi; \operatorname{Re}(z) < 0$$

01.17.27.0242.01

$$\csc^{-1}(z) = -\cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.0243.01

$$\csc^{-1}(z) = \pi - \cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.0244.01

$$\csc^{-1}(z) = \sqrt{\frac{1}{z^2}} \sqrt{z^2} \left(\frac{\pi}{2} \left(\frac{z}{\sqrt{z^2}} - 1 \right) + \cos^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

01.17.27.0245.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0246.01

$$\csc^{-1}(z) = -\cos^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0247.01

$$\csc^{-1}(z) = z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

01.17.27.0248.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0249.01

$$\csc^{-1}(z) = -\cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0250.01

$$\csc^{-1}(z) = \pi - \cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0251.01

$$\csc^{-1}(z) = \cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0252.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} - \sqrt{1 - \frac{1}{z^2}}} z \sqrt{\frac{1}{z^2 - 1}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

01.17.27.0253.01

$$\csc^{-1}(z) = \cos^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0254.01

$$\csc^{-1}(z) = -\cos^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0255.01

$$\csc^{-1}(z) = z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\cos^{-1}\left(\frac{2\sqrt{-1+z^2}}{z^2}\right)$

01.17.27.0256.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{2z} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2\sqrt{-1+z^2}}{z^2}\right) \right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0257.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{z}{\sqrt{\frac{1-z^2}{z^2}}} \sqrt{\frac{1-z^2}{z^4}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-1}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2}\right) \right) \right)$$

Involving $\csc^{-1}(\sqrt{z})$

Involving $\csc^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0258.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}(\sqrt{z})$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0259.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-\infty, 0)$$

01.17.27.0260.01

$$\csc^{-1}(\sqrt{z}) = \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0261.01

$$\csc^{-1}(\sqrt{z}) = \sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \cos^{-1}\left(\sqrt{\frac{1}{z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.17.27.0262.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \cos^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cos^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.17.27.0263.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \cos^{-1}\left(1/\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0264.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \cos^{-1}\left(1/\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0265.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \cos^{-1}\left(1/\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{z^2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0266.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0267.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0268.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(a(bz^c)^m\right)$

Involving $\csc^{-1}\left(a(bz^c)^m\right)$ and $\cos^{-1}\left(\frac{1}{a}b^{-m}z^{-mc}\right)$

01.17.27.0269.01

$$\csc^{-1}\left(a(bz^c)^m\right) = \frac{(bz^c)^m}{b^m z^{mc}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{a}b^{-m}z^{-mc}\right)\right) /; 2m \in \mathbb{Z}$$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$ and $\cos^{-1}(z)$

01.17.27.0270.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2 \cos^{-1}(z) - \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0271.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{3\pi}{2} - 2 \cos^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0272.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{\pi}{2} \left(1 - \frac{2\sqrt{z^2}}{z}\right) + \frac{2\sqrt{z^2}}{z} \cos^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$ and $\cos^{-1}(z)$

01.17.27.0273.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -2\cos^{-1}(z) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0274.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -\frac{3\pi}{2} + 2\cos^{-1}(z); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0275.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = \frac{\pi}{2} \left(\frac{2\sqrt{z^2}}{z} - 1 \right) - \frac{2\sqrt{z^2}}{z} \cos^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0276.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = -\frac{\pi}{2} + 2\cos^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0277.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{3\pi}{2} - 2\cos^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0278.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{\pi}{2} \left(1 - 2z \sqrt{\frac{1}{z^2}} \right) + 2z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2}{2-z^2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{2-z^2}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0279.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = \frac{\pi}{2} - 2\cos^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0280.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = -\frac{3\pi}{2} + 2 \cos^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0281.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = \frac{\pi}{2} \left(2z \sqrt{\frac{1}{z^2} - 1} \right) - 2z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.17.27.0011.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \cos^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\cos^{-1}(\sqrt{z})$

01.17.27.0282.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \cos^{-1}(\sqrt{z}); z \notin (1, \infty)$$

01.17.27.0283.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\cos^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0284.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \sqrt{1-z} \sqrt{\frac{1}{1-z}} \cos^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$ and $\cos^{-1}(z)$

01.17.27.0285.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{\pi - \cos^{-1}(z)}{2}$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\cos^{-1}(z)$

01.17.27.0286.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{1}{2} \cos^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\cos^{-1}(z)$

01.17.27.0012.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{1}{2} \cos^{-1}(z) \text{ ; } z \notin (1, \infty)$$

01.17.27.0287.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{1}{2} \cos^{-1}(z) \text{ ; } (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0288.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{\sqrt{1-z}}{2} \sqrt{\frac{1}{1-z}} \cos^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\cos^{-1}(z)$

01.17.27.0289.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} (\pi - \cos^{-1}(z)) \text{ ; } z \notin (-\infty, -1)$$

01.17.27.0290.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} (\cos^{-1}(z) - \pi) \text{ ; } (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0291.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{\sqrt{z+1}}{2} \sqrt{\frac{1}{z+1}} (\pi - \cos^{-1}(z))$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0292.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.17.27.0293.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0294.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) + \sqrt{\frac{1}{z}} \sqrt{z} \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0295.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0296.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, 1)$$

01.17.27.0297.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\cos^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0298.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0299.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \left(\frac{1}{2}\pi \left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right) + \sqrt{\frac{1}{z}} \sqrt{z} \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0300.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (0, 1)$$

01.17.27.0301.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\cos^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0302.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\sqrt{-1+z} \sqrt{-z}}{\sqrt{(1-z)z}} \cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0303.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < |\arg(z)| < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0304.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\cos^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0305.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \pi - \cos^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0306.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) + \sqrt{\frac{1}{z-1}} \sqrt{z-1} \cos^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0307.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \cos^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (0, 1)$$

01.17.27.0308.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\cos^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0309.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\sqrt{-1+z} \sqrt{-z}}{\sqrt{(1-z)z}} \cos^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0310.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0311.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \left(\pi - \cos^{-1}\left(\frac{1}{z}\right) \right); z \notin (-1, 0)$$

01.17.27.0312.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0313.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \left(\pi - \cos^{-1}\left(\frac{1}{z}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{a-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0314.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right); z \notin (0, 1)$$

01.17.27.0315.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0316.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0317.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2} \left(\pi - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+a}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0318.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right); z \notin (0, 1)$$

01.17.27.0319.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2} \cos^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0320.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2} \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0321.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2} \left(\pi - \cos^{-1}\left(\frac{1}{z}\right)\right); z \notin (-1, 0)$$

01.17.27.0322.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2} \left(\cos^{-1}\left(\frac{1}{z}\right) - \pi\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0323.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2} \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \left(\pi - \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\cos^{-1}(z)$

01.17.27.0324.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \cos^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0325.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi - \cos^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0326.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2} \cos^{-1}(z)}{z} + \frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\cos^{-1}(z)$

01.17.27.0327.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \cos^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0328.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi - \cos^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0329.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\cos^{-1}(z) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0330.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \cos^{-1}(z) - \pi /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0331.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} \left(\frac{1}{2}\pi \left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{\sqrt{z^2}}{z} \cos^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0332.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \cos^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0$$

01.17.27.0333.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \cos^{-1}\left(\frac{1}{z}\right) - \pi /; \operatorname{Re}(z) < 0$$

01.17.27.0334.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \pi - \cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.0335.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\cos^{-1}\left(\frac{1}{z}\right) /; (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.0336.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1\right) + \cos^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) \neq 0$$

01.17.27.0337.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2}}{2z} \left(2 \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right) z - \pi \sqrt{\frac{1}{z^2}} z + \pi\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0338.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0339.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \pi - \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0340.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z^2}} z\right) + z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0341.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0342.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \pi - \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0343.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -\cos^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0344.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \cos^{-1}\left(\frac{1}{z}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0345.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sqrt{1 - \frac{1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \left(\frac{1}{2} \pi \left(1 - \sqrt{\frac{1}{z^2}} z\right) + z \sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0346.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \cos^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0347.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \pi - \cos^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0348.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\pi + \cos^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0349.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\cos^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0350.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\sqrt{-z^2} \sqrt{z^2-1}}{2\sqrt{z^2-z^4}} \left(2\sqrt{\frac{1}{z^2}} \cos^{-1}\left(\frac{1}{z}\right) z - \pi \sqrt{\frac{1}{z^2}} z + \pi \right)$$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$ and $\cos^{-1}(z)$

01.17.27.0351.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2\cos^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.27.0352.01

$$\begin{aligned} \operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) &= \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{z^2-1}\sqrt{2z^2-1}} \\ &\left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}z+1}}\sqrt{\sqrt{2}z+1} + \sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}z}}\sqrt{1-\sqrt{2}z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}} - 2\right) + \\ &\frac{2\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{-z^2}\sqrt{z^2-1}\sqrt{2z^2-1}}\cos^{-1}(z) \end{aligned}$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0353.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \pi - 2\cos^{-1}\left(\frac{1}{z}\right); \frac{\pi}{4} \leq |\arg(z)| < \frac{\pi}{2} \vee |z| \geq \sqrt{2} \wedge |\arg(z)| < \frac{\pi}{4}$$

01.17.27.0354.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \frac{2\sqrt{z^2}}{z}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right); \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0355.01

$$\begin{aligned} \operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) &= \\ &-\frac{z^3\sqrt{z^2-2}\sqrt{z^2-1}}{2\sqrt{1-z}(z+1)\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{\frac{1}{z}}\sqrt{\frac{-z+1}{z}}\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}}z - \right.\right. \\ &\left.\left.\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}-2\right) + 4\cos^{-1}\left(\frac{1}{z}\right)\right) \end{aligned}$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right)$ and $\cos^{-1}(z)$

01.17.27.0356.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}(z)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0357.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\cos^{-1}(z) - \frac{\pi}{2}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0358.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right)$ and $\cos^{-1}(z)$

01.17.27.0359.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}(z)\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0360.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\cos^{-1}(z) - \frac{\pi}{2}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0361.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}z\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right)$ and $\cos^{-1}(z)$

01.17.27.0362.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right)$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right)$ and $\cos^{-1}(z)$

01.17.27.0363.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0364.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0365.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0366.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\cos^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0367.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0368.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{1}{2} \sqrt{-iz} \sqrt{-\frac{1}{iz}} \left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right) - \frac{1}{4} \pi \left(\frac{\sqrt{z^2-1}}{z} - 1\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right)$ and $\cos^{-1}\left(\frac{1}{z}\right)$

01.17.27.0369.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0370.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - \cos^{-1}\left(\frac{1}{z}\right)\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0371.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\cos^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0372.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\sqrt{\frac{i}{z}}\sqrt{-iz}\left(\frac{\pi}{2}-\cos^{-1}\left(\frac{1}{z}\right)\right) - \frac{\pi}{4}\left(i\sqrt{\frac{i}{z}}\sqrt{-iz}-\sqrt{iz}\sqrt{\frac{1}{iz}}\right)$$

Involving \tan^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\sqrt{z^2-1}\right)$

01.17.27.0373.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \tan^{-1}\left(\sqrt{z^2-1}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0374.01

$$\csc^{-1}(z) = \tan^{-1}\left(\sqrt{z^2-1}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0375.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{z^2-1}\right)\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

01.17.27.0376.01

$$\csc^{-1}(z) = \tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0377.01

$$\csc^{-1}(z) = -\tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0378.01

$$\csc^{-1}(z) = -\tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0379.01

$$\csc^{-1}(z) = \tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) + \pi /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0380.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \tan^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right) - \frac{i\pi\sqrt{z^2}}{2z} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

01.17.27.0381.01

$$\csc^{-1}(z) = \tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0382.01

$$\csc^{-1}(z) = -\tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0383.01

$$\csc^{-1}(z) = \pi - \tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0384.01

$$\csc^{-1}(z) = \tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0385.01

$$\csc^{-1}(z) = z \sqrt{1 - \frac{1}{z^2}} \sqrt{\frac{1}{z^2-1}} \tan^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \frac{i\pi \sqrt{z^2}}{2z} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{2\sqrt{z^2-1}}{-2+z^2}\right)$

01.17.27.0386.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{2z} \tan^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0387.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \sqrt{\frac{z}{\sqrt{2}-z}} \sqrt{\frac{1}{z}} \sqrt{\frac{\sqrt{2}-z}{z}} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\frac{z}{z+\sqrt{2}}} \sqrt{-\frac{z+\sqrt{2}}{z}} + \frac{1}{\sqrt{\frac{1-z^2}{z^4}} z} \sqrt{\frac{1-z^2}{z^2}} \right) + \frac{2\sqrt{z^2}}{z} \tan^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{-2+z^2}{2\sqrt{z^2-1}}\right)$

01.17.27.0388.01

$$\csc^{-1}(z) = \frac{\pi}{4} - \frac{1}{2} \tan^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right) ; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0389.01

$$\csc^{-1}(z) = -\frac{\pi}{4} + \frac{1}{2} \tan^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right) ; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0390.01

$$\csc^{-1}(z) = -\frac{3\pi}{4} + \frac{1}{2} \tan^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0391.01

$$\csc^{-1}(z) = \frac{3\pi}{4} - \frac{1}{2} \tan^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0392.01

$$\csc^{-1}(z) = \frac{1}{4} \left(-\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} + \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} + \frac{\sqrt{z^2}}{z} \right) \pi - \frac{\sqrt{z^2}}{2z} \tan^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$

01.17.27.0393.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \tan^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) ; z \notin (-1, 0)$$

01.17.27.0394.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) - \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0395.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \tan^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$

01.17.27.0396.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \tan^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) ; z \notin (-1, 1)$$

01.17.27.0397.01

$$\csc^{-1}(z) = 2 \tan^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-1-z}} \right) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0398.01

$$\csc^{-1}(z) = -2 \tan^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-1-z}} \right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0399.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) + \frac{2\sqrt{-z-1} \sqrt{1-z} \sqrt{z}}{\sqrt{z-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z+1}} \tan^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right)$

01.17.27.0400.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \tan^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right) /; z \notin (-1, 0)$$

01.17.27.0401.01

$$\csc^{-1}(z) = 2 \tan^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0402.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \tan^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right)$

01.17.27.0403.01

$$\csc^{-1}(z) = 2 \tan^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right) - \frac{\pi}{2} /; z \notin (-1, 1)$$

01.17.27.0404.01

$$\csc^{-1}(z) = 2 \tan^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0405.01

$$\csc^{-1}(z) = -2 \tan^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0406.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} \sqrt{\frac{1}{z}} \sqrt{z} \tan^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$

01.17.27.0407.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) - \frac{\pi}{2} ; z \notin (0, 1)$$

01.17.27.0408.01

$$\csc^{-1}(z) = -2 \tan^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) + \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0409.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{-1+z} \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{1+z}} \sqrt{\frac{1+z}{-1+z}} \tan^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$

01.17.27.0410.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) - \frac{\pi}{2} ; z \notin (0, 1)$$

01.17.27.0411.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2 \tan^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0412.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \tan^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(z + \sqrt{z^2 - 1}\right)$

01.17.27.0413.01

$$\csc^{-1}(z) = \pi - 2 \tan^{-1}\left(z + \sqrt{z^2 - 1}\right) ; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0414.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(z + \sqrt{z^2 - 1}\right) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0415.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} + 1 \right) - \frac{2\sqrt{z^2}}{z} \tan^{-1}\left(z + \sqrt{z^2 - 1}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(z - \sqrt{z^2 - 1}\right)$

01.17.27.0416.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(z - \sqrt{z^2 - 1}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0417.01

$$\csc^{-1}(z) = -2 \tan^{-1}\left(z - \sqrt{z^2 - 1}\right) - \pi /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0418.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{2\sqrt{z^2}}{z} \tan^{-1}\left(z - \sqrt{z^2 - 1}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right)$

01.17.27.0419.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0420.01

$$\csc^{-1}(z) = -2 \tan^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right) - \pi /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0421.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{2\sqrt{z^2}}{z} \tan^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tan^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right)$

01.17.27.0422.01

$$\csc^{-1}(z) = \pi - 2 \tan^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0423.01

$$\csc^{-1}(z) = 2 \tan^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0424.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} + 1\right) - \frac{2\sqrt{z^2}}{z} \tan^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tan^{-1}(z)$

01.17.27.0013.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \tan^{-1}(z) \quad ; \quad |z| < 1$$

01.17.27.0425.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi - 2 \tan^{-1}(z) \quad ; \quad |z| > 1 \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0426.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2 \tan^{-1}(z) - \pi \quad ; \quad |z| > 1 \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.17.27.0427.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{z} - 2 \tan^{-1}(z) \quad ; \quad |z| > 1$$

01.17.27.0428.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{2z} \left(1 - \frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2}\right) + \frac{2(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0429.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi - 2 \tan^{-1}\left(\frac{1}{z}\right) \quad ; \quad |z| < 1 \wedge -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0430.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2 \tan^{-1}\left(\frac{1}{z}\right) - \pi \quad ; \quad |z| < 1 \wedge \left(\frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}\right)$$

01.17.27.0431.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi z \sqrt{\frac{1}{z^2}} - 2 \tan^{-1}\left(\frac{1}{z}\right) \quad ; \quad |z| < 1$$

01.17.27.0432.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \tan^{-1}\left(\frac{1}{z}\right) \quad ; \quad |z| > 1$$

01.17.27.0433.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right)} - \frac{2(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tan^{-1}(z')$

01.17.27.0434.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \tan^{-1}\left(\frac{1-z}{z} \sqrt{\left(\frac{z+1}{z-1}\right)^2}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tan^{-1}(\sqrt{-z})$

01.17.27.0435.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2 \tan^{-1}(\sqrt{-z}) \quad ; z \notin (1, \infty)$$

01.17.27.0436.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \tan^{-1}(\sqrt{-z}) - \frac{3\pi}{2} \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0437.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z} - \frac{1}{2}} \right) \pi - 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \tan^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.0438.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2} \quad ; z \notin (0, \infty)$$

01.17.27.0439.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2 \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2} \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0440.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{1}{2} \pi \left(2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 2 \sqrt{-\frac{1}{z}} \sqrt{-z} - 1 \right) + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tan^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.0441.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \tan^{-1}\left(\sqrt{\frac{1}{-z}}\right) - \frac{\pi}{2} \quad ; z \notin (0, 1)$$

01.17.27.0442.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{3\pi}{2} - 2 \tan^{-1}\left(\sqrt{\frac{1}{-z}}\right) \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0443.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} \left(-2 \sqrt{\frac{1}{-z}} \sqrt{-z} + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 1 \right) + 2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tan^{-1}(\sqrt{-z})$

01.17.27.0444.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} + 2 \tan^{-1}(\sqrt{-z}) \quad ; z \notin (1, \infty)$$

01.17.27.0445.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \tan^{-1}(\sqrt{-z}) + \frac{3\pi}{2} \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0446.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right)\pi + 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \tan^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.0447.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi}{2} \quad ; z \notin (0, \infty)$$

01.17.27.0448.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2 \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi}{2} \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0449.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} \left(-2 \sqrt{\frac{1}{-z}} \sqrt{-z} + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 1 \right) - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \tan^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tan^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.0450.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \tan^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{\pi}{2} \quad ; z \notin (0, 1)$$

01.17.27.0451.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{3\pi}{2} + 2 \tan^{-1}\left(\sqrt{-\frac{1}{z}}\right) \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0452.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} \left(-2 \sqrt{-\frac{1}{z}} \sqrt{-z} + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 1 \right) - 2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \tan^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tan^{-1}(\sqrt{z})$

01.17.27.0453.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} - 2 \tan^{-1}(\sqrt{z}) \quad ; z \notin (-\infty, -1)$$

01.17.27.0454.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \tan^{-1}(\sqrt{z}) - \frac{3\pi}{2} \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0455.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}} \right) \pi - 2 \sqrt{z+1} \sqrt{\frac{1}{z+1}} \tan^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0456.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} \quad ; |\arg(z)| < \pi$$

01.17.27.0457.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2 \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0458.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} \left(-2 \sqrt{\frac{1}{z}} \sqrt{z} + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0459.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} ; z \notin (-1, 0)$$

01.17.27.0460.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{3\pi}{2} - 2 \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0461.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \pi \left(\frac{1}{2} - \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \right) + 2 \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tan^{-1}(\sqrt{z})$

01.17.27.0462.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} + 2 \tan^{-1}(\sqrt{z}) ; z \notin (-\infty, -1)$$

01.17.27.0463.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \tan^{-1}(\sqrt{z}) + \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0464.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\left(\sqrt{z+1} \sqrt{\frac{1}{z+1}} - \frac{1}{2}\right) \pi + 2 \sqrt{z+1} \sqrt{\frac{1}{z+1}} \tan^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0465.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} ; |\arg(z)| < \pi$$

01.17.27.0466.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2 \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0467.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} \left(-2 \sqrt{\frac{1}{z}} \sqrt{z} + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0468.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} ; z \notin (-1, 0)$$

01.17.27.0469.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{3\pi}{2} + 2 \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0470.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} \left(-2 \sqrt{\frac{1}{z}} \sqrt{z} + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$ and $\tan^{-1}(z)$

01.17.27.0471.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{\pi}{2} - 2 \tan^{-1}(z) ; \operatorname{Re}(z) > 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0472.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \tan^{-1}(z) + \frac{\pi}{2} ; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0473.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = -2 \tan^{-1}(z) - \frac{3\pi}{2} ; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0474.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \tan^{-1}(z) - \frac{3\pi}{2} ; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0014.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{\pi}{2} - \frac{2\sqrt{z^2}}{z} \tan^{-1}(z) ; iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.17.27.0475.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2 \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right) - \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0476.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} ; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0477.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = -2 \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0478.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \tan^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2}; (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0479.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{3\pi}{2} - 2 \tan^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0480.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} \left(2 \sqrt{\frac{-i}{z}} \sqrt{iz} \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2 \sqrt{\frac{i}{z}} \sqrt{-iz} \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right)$

Involving $\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right)$ and $\tan^{-1}(z)$

01.17.27.0481.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} + 2 \tan^{-1}(z); \operatorname{Re}(z) > 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0482.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \tan^{-1}(z) - \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0483.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = 2 \tan^{-1}(z) + \frac{3\pi}{2}; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0484.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \tan^{-1}(z) + \frac{3\pi}{2}; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0485.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} + \frac{2\sqrt{z^2}}{z} \tan^{-1}(z); iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.17.27.0486.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} \left(2 \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2 \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right) + \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0487.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0488.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = 2 \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0489.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \tan^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2}; (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0490.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{3\pi}{2} + 2 \tan^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0491.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} \left(2 \sqrt{-\frac{i}{z}} \sqrt{iz} \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2 \sqrt{\frac{i}{z}} \sqrt{-iz} \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right)$$

Involving $\csc^{-1}(\sqrt{1+z})$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\tan^{-1}(\sqrt{z})$

01.17.27.0015.01

$$\csc^{-1}(\sqrt{z+1}) = \frac{\pi}{2} - \tan^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0492.01

$$\csc^{-1}(\sqrt{z+1}) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-1, 0)$$

01.17.27.0493.01

$$\csc^{-1}(\sqrt{z+1}) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0494.01

$$\csc^{-1}(\sqrt{z+1}) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0495.01

$$\csc^{-1}(\sqrt{z+1}) = \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0496.01

$$\csc^{-1}(\sqrt{z+1}) = -\tan^{-1}\left(\sqrt{\frac{1}{z}}\right) + \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0497.01

$$\csc^{-1}(\sqrt{z+1}) = -\tan^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0498.01

$$\csc^{-1}(\sqrt{z+1}) = \sqrt{z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z+a}}{\sqrt{z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z+a}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{z}{a}}\right)$

01.17.27.0499.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \tan^{-1}(\sqrt{z}); z \notin (-\infty, -1)$$

01.17.27.0500.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \pi - \tan^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0021.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{1}{2} \left(\pi - \sqrt{\frac{1}{z+1}} \sqrt{z+1} (\pi - 2 \tan^{-1}(\sqrt{z})) \right)$$

01.17.27.0020.01

$$\csc^{-1}\left(\frac{\sqrt{a+z}}{\sqrt{z}}\right) = \frac{1}{2\sqrt{z}} \left(\sqrt{\frac{z}{a+z}} \sqrt{a+z} \right) \left(\pi - \sqrt{\frac{a}{a+z}} \sqrt{\frac{z}{a} + 1} (\pi - 2 \tan^{-1}\left(\sqrt{\frac{z}{a}}\right)) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0501.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.17.27.0502.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = -\tan^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0503.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0504.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi}{2} \sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0505.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-1, 0)$$

01.17.27.0506.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \tan^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0507.01

$$\csc^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{z}}\right) = \frac{\sqrt{-z-1} \sqrt{z}}{\sqrt{-z} \sqrt{z+1}} \left(\frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.17.27.0508.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \tan^{-1}(\sqrt{z}); |\arg(z)| < \pi$$

01.17.27.0509.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = -\tan^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0510.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \pi - \tan^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0511.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{1}{2} \sqrt{1 + \frac{1}{z}} \sqrt{\frac{z}{z+1}} \left(\pi - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \left(\pi - 2 \tan^{-1}(\sqrt{z}) \right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0512.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) ; |\arg(z)| < \pi$$

01.17.27.0513.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} ; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0514.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{(z+1)^2}} \sqrt{z+1} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0515.01

$$\csc^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$ and $\tan^{-1}(\sqrt{z})$

01.17.27.0516.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \tan^{-1}(\sqrt{z}) ; |\arg(z)| < \pi$$

01.17.27.0517.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\tan^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0518.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \pi - \tan^{-1}(\sqrt{z}) \ ; \ (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0022.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right) + \sqrt{\frac{1}{z}} \sqrt{z} \tan^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0519.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) \ ; \ |\arg(z)| < \pi$$

01.17.27.0520.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \tan^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} \ ; \ (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0521.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} - \sqrt{z} \sqrt{\frac{1}{z}} \tan^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0522.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{1+z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{1+z^2}\right)$ and $\tan^{-1}(z)$

01.17.27.0523.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \frac{\pi}{2} - \tan^{-1}(z) \ ; \ -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0524.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \tan^{-1}(z) + \frac{\pi}{2} \ ; \ \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0016.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \frac{\pi}{2} - \frac{\sqrt{z^2}}{z} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{1+z^2}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0525.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = -\tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0526.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0527.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \pi - \tan^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0528.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \tan^{-1}\left(\frac{1}{z}\right) + \pi; (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0529.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \frac{\sqrt{z^2}}{z} \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \left(\frac{\sqrt{-iz-1}}{\sqrt{iz+1}} + \frac{\sqrt{iz-1}}{\sqrt{1-iz}} \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\tan^{-1}(z)$

01.17.27.0017.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \tan^{-1}(z); iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.17.27.0530.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \pi - \tan^{-1}(z); (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0531.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\tan^{-1}(z) - \pi; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0018.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi}{2} \left(\sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} \right) + \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0532.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0533.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0534.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0535.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0536.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi z}{2\sqrt{z^2+1}} \sqrt{1 + \frac{1}{z^2}} - \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\tan^{-1}(z)$

01.17.27.0537.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \tan^{-1}(z); \operatorname{Re}(z) > 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0538.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\tan^{-1}(z); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0539.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \pi - \tan^{-1}(z); (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0540.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \tan^{-1}(z) + \pi /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0541.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1}\right) + \frac{\sqrt{z^2+1} \sqrt{z^2}}{z} \sqrt{\frac{1}{z^2+1}} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0542.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0543.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0544.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0545.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \tan^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0546.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{\sqrt{z^2+1}} \sqrt{\frac{z^2+1}{z^2}} \left(\frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \tan^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$ and $\tan^{-1}(z)$

01.17.27.0547.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = -\tan^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0548.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \tan^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0549.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \tan^{-1}(z) + \pi /; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0550.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \pi - \tan^{-1}(z) /; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0551.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = z \sqrt{\frac{1}{z^2}} \tan^{-1}(z) - \frac{1}{2} \pi \left(\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 2 \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0552.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0553.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0554.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\tan^{-1}(z)$

01.17.27.0555.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \tan^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0556.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\tan^{-1}(z) /; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0557.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \pi - \tan^{-1}(z) /; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0558.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \pi + \tan^{-1}(z) /; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0559.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = z \sqrt{\frac{1}{z^2}} \tan^{-1}(z) - \frac{1}{2} \pi \left(\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 2 \right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0560.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi}{2} - \tan^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0561.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0562.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2} (1+z^2)^{1/4} \sqrt{\sqrt{1+z^2} - 1}\right)$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} \sqrt{\sqrt{1+z^2}-1}\right)$ and $\tan^{-1}(z)$

01.17.27.0563.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-1}}\right) = \frac{1}{2} \tan^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0564.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-1}}\right) = -\frac{1}{2} \tan^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0565.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-1}}\right) = \frac{\sqrt{z^2} \tan^{-1}(z)}{2z}$$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-1}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0566.01

$$\csc^{-1}\left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{\pi}{4} - \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0567.01

$$\csc^{-1}\left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{\pi}{4} + \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right) /; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0568.01

$$\csc^{-1}\left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = -\frac{\pi}{4} - \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right) /; (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0569.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = -\frac{\pi}{4} + \frac{1}{2}\tan^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0570.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}(1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{1}{4}\pi\sqrt{z^2}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1} - \frac{\sqrt{z^2}}{2z}\tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}(1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-z}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}(1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-z}\right)$ and $\tan^{-1}(z)$

01.17.27.0571.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{4} - \frac{1}{2}\tan^{-1}(z); iz \notin (1, \infty)$$

01.17.27.0572.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\tan^{-1}(z) + \frac{3\pi}{4}; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0573.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{1}{4}\pi\left(2 - \sqrt{1-iz}\sqrt{\frac{1}{1-iz}}\right) - \frac{1}{2}\sqrt{1-iz}\sqrt{\frac{1}{1-iz}}\tan^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}(1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-z}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0574.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}} \right) = \frac{1}{2} \tan^{-1} \left(\frac{1}{z} \right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1) \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0575.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}} \right) = \frac{\pi}{2} + \frac{1}{2} \tan^{-1} \left(\frac{1}{z} \right); \operatorname{Re}(z) < 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0576.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}} \right) = \frac{1}{4} \pi \left(1 - \frac{\sqrt{z^2}}{z} \right) + \frac{1}{2} \tan^{-1} \left(\frac{1}{z} \right); z \notin (-1, \infty)$$

01.17.27.0577.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}} \right) = \frac{\pi}{4} \left(-\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} + \sqrt{\frac{z}{z+i}} \sqrt{\frac{z+i}{z}} - \frac{\sqrt{z^2}}{z} + 1 \right) + \frac{1}{2} \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} \tan^{-1} \left(\frac{1}{z} \right)$$

Involving $\operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}} \right)$

Involving $\operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}} \right)$ and $\tan^{-1}(z)$

01.17.27.0578.01

$$\operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}} \right) = \frac{1}{2} \tan^{-1}(z); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1) \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0579.01

$$\operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}} \right) = -\frac{1}{2} \tan^{-1}(z); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0580.01

$$\operatorname{csc}^{-1} \left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}} \right) = \frac{1}{2} \sqrt{\frac{1}{z^2}} z \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0581.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{\pi}{4} - \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0582.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0583.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{\pi}{4} \left(-\frac{\sqrt{z^2}\sqrt{-z^2-1}}{\sqrt{-z^2(z^2+1)}} + \sqrt{z^2} \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} + 1 \right) - \frac{\sqrt{z}\sqrt{-z^2-1}}{2\sqrt{-z}\sqrt{z^2+1}} \tan^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$ and $\tan^{-1}(z)$

01.17.27.0584.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{4} - \frac{1}{2} \tan^{-1}(z); iz \notin (1, \infty)$$

01.17.27.0585.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2} \tan^{-1}(z) + \frac{3\pi}{4}; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0586.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right) = \frac{\pi}{4} \left(2 - \sqrt{1-iz} \sqrt{\frac{1}{1-iz}} \right) - \frac{1}{2} \sqrt{1-iz} \sqrt{\frac{1}{1-iz}} \tan^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$ and $\tan^{-1}\left(\frac{1}{z}\right)$

01.17.27.0587.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1) \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0588.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{2} + \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0589.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{2} - \frac{1}{2} \tan^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0590.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2} \sqrt{1-iz} \sqrt{\frac{1}{1-iz}} \tan^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4} \left(-\sqrt{\frac{1}{z^2}} z + \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} - \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} + 1 \right)$$

Involving $\csc^{-1}\left(\sqrt{az^c+1}\right)$

Involving $\csc^{-1}\left(\sqrt{az^c+1}\right)$ and $\tan^{-1}\left(\frac{1}{\sqrt{a}z^{c/2}}\right)$

01.17.27.0591.01

$$\csc^{-1}\left(\sqrt{az^c+1}\right) = \frac{\sqrt{a}z^{c/2}}{\sqrt{az^c}} \tan^{-1}\left(\frac{1}{\sqrt{a}z^{c/2}}\right) - \frac{1}{2} i\pi \left(\frac{\sqrt{-i\sqrt{a}\sqrt{z^c}-1}}{\sqrt{i\sqrt{a}\sqrt{z^c}+1}} + \frac{\sqrt{i\sqrt{a}\sqrt{z^c}-1}}{\sqrt{1-i\sqrt{a}\sqrt{z^c}}} \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{a^2z^{2c}+1}}{az^c}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{a^2z^{2c}+1}}{az^c}\right)$ and $\tan^{-1}(az^c)$

01.17.27.0019.02

$$\csc^{-1}\left(\frac{\sqrt{a^2z^{2c}+1}}{az^c}\right) = \frac{1}{2} \pi \left(\sqrt{\frac{1}{1-iaz^c}} \sqrt{1-iaz^c} - \sqrt{\frac{1}{aiz^c+1}} \sqrt{aiz^c+1} \right) + \sqrt{\frac{1}{a^2z^{2c}+1}} \sqrt{a^2z^{2c}+1} \tan^{-1}(az^c)$$

Involving \cot^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\sqrt{z^2 - 1}\right)$

01.17.27.0592.01

$$\csc^{-1}(z) = \cot^{-1}\left(\sqrt{z^2 - 1}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0593.01

$$\csc^{-1}(z) = -\cot^{-1}\left(\sqrt{z^2 - 1}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0594.01

$$\csc^{-1}(z) = -\cot^{-1}\left(\sqrt{z^2 - 1}\right) - \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0595.01

$$\csc^{-1}(z) = \cot^{-1}\left(\sqrt{z^2 - 1}\right) + \pi; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0596.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \cot^{-1}\left(\sqrt{z^2 - 1}\right) - \frac{i\pi\sqrt{z^2}}{2z} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}} \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z^2-1}}\right)$

01.17.27.0597.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \cot^{-1}\left(\frac{1}{\sqrt{z^2 - 1}}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0598.01

$$\csc^{-1}(z) = \cot^{-1}\left(\frac{1}{\sqrt{z^2 - 1}}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0599.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \cot^{-1}\left(\frac{1}{\sqrt{z^2 - 1}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right)$

01.17.27.0600.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \cot^{-1}\left(\sqrt{\frac{1}{z^2 - 1}}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0601.01

$$\csc^{-1}(z) = \cot^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0602.01

$$\csc^{-1}(z) = \cot^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.0603.01

$$\csc^{-1}(z) = -\cot^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.0604.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \sqrt{\frac{1}{z^2-1}} \sqrt{z^2-1} \cot^{-1}\left(\sqrt{\frac{1}{z^2-1}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right)$

01.17.27.0605.01

$$\csc^{-1}(z) = \frac{\pi}{4} - \frac{1}{2} \cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0606.01

$$\csc^{-1}(z) = -\frac{\pi}{4} + \frac{1}{2} \cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0607.01

$$\csc^{-1}(z) = -\frac{3\pi}{4} + \frac{1}{2} \cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0608.01

$$\csc^{-1}(z) = \frac{3\pi}{4} - \frac{1}{2} \cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0609.01

$$\csc^{-1}(z) = \frac{1}{4} \left(-\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} + \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} + \frac{\sqrt{z^2}}{z} \right) \pi - \frac{\sqrt{z^2}}{2z} \cot^{-1}\left(\frac{2\sqrt{z^2-1}}{z^2-2}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{-2+z^2}{2\sqrt{z^2-1}}\right)$

01.17.27.0610.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{2z} \cot^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0611.01

$$\csc^{-1}(z) =$$

$$\frac{1}{4} \pi \left(\sqrt{\frac{1}{z^2}} z + \sqrt{\frac{z}{\sqrt{2}-z}} \sqrt{\frac{1}{z}} \sqrt{\frac{\sqrt{2}-z}{z}} \sqrt{z} - \sqrt{\frac{1}{z}} \sqrt{-z} \sqrt{-\frac{z}{z+\sqrt{2}}} \sqrt{-\frac{z+\sqrt{2}}{z}} + \frac{1}{\sqrt{\frac{1-z^2}{z^4}}} \sqrt{\frac{1-z^2}{z^2}} \right) + \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(\frac{z^2-2}{2\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$

01.17.27.0612.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) - \frac{\pi}{2} /; z \notin (-1, 1)$$

01.17.27.0613.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0614.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0615.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} \sqrt{\frac{1}{z}} \sqrt{z} \cot^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right)$

01.17.27.0616.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) - \frac{\pi}{2} /; z \notin (0, 1)$$

01.17.27.0617.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-1-z}}\right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0618.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{-1+z} \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{1+z}} \sqrt{\frac{1+z}{-1+z}} \cot^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{-1-z}} \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right)$

01.17.27.0619.01

$$\csc^{-1}(z) = 2 \cot^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right) - \frac{\pi}{2} ; z \notin (-1, 1)$$

01.17.27.0620.01

$$\csc^{-1}(z) = -2 \cot^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0621.01

$$\csc^{-1}(z) = 2 \cot^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right) + \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0622.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + 2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \cot^{-1} \left(\sqrt{\frac{z-1}{z+1}} \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right)$

01.17.27.0623.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \cot^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right) ; z \notin (-1, 0)$$

01.17.27.0624.01

$$\csc^{-1}(z) = 2 \cot^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right) - \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0625.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \cot^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1} \left(\frac{\sqrt{-1-z}}{\sqrt{1-z}} \right)$

01.17.27.0626.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \cot^{-1} \left(\frac{\sqrt{-1-z}}{\sqrt{1-z}} \right) ; z \notin (-1, 1)$$

01.17.27.0627.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0628.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0629.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) + \frac{2 \sqrt{-z-1} \sqrt{1-z} \sqrt{z}}{\sqrt{z-1}} \sqrt{\frac{1}{z}} \sqrt{\frac{1}{z+1}} \cot^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$

01.17.27.0630.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \cot^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) /; z \notin (-1, 1)$$

01.17.27.0631.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0632.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0633.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \cot^{-1}\left(\sqrt{\frac{z+1}{z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(z + \sqrt{z^2 - 1}\right)$

01.17.27.0634.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(z + \sqrt{z^2 - 1}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0635.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(z + \sqrt{z^2 - 1}\right) - \pi /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0636.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1 \right) + \frac{2 \sqrt{z^2}}{z} \cot^{-1}\left(z + \sqrt{z^2 - 1}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(z - \sqrt{z^2 - 1}\right)$

01.17.27.0637.01

$$\csc^{-1}(z) = \pi - 2 \cot^{-1}\left(z - \sqrt{z^2 - 1}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0638.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(z - \sqrt{z^2 - 1}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0639.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} + 1 \right) - \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(z - \sqrt{z^2 - 1}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right)$

01.17.27.0640.01

$$\csc^{-1}(z) = \pi - 2 \cot^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0641.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0642.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} + 1 \right) - \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z + \sqrt{z^2 - 1}}\right)$$

Involving $\csc^{-1}(z)$ and $\cot^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right)$

01.17.27.0643.01

$$\csc^{-1}(z) = 2 \cot^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0644.01

$$\csc^{-1}(z) = -2 \cot^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right) - \pi /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0645.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1 \right) + \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z - \sqrt{z^2 - 1}}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\cot^{-1}(z)$

01.17.27.0646.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi - 2 \cot^{-1}(z) ; |z| < 1 \wedge -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0647.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2 \cot^{-1}(z) - \pi ; |z| < 1 \wedge \left(\frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}\right)$$

01.17.27.0648.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi z \sqrt{\frac{1}{z^2}} - 2 \cot^{-1}(z) ; |z| < 1$$

01.17.27.0023.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \cot^{-1}(z) ; |z| > 1$$

01.17.27.0649.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right)} - \frac{2(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \cot^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0650.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \cot^{-1}\left(\frac{1}{z}\right) ; |z| < 1$$

01.17.27.0651.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi - 2 \cot^{-1}\left(\frac{1}{z}\right) ; |z| > 1 \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0652.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2 \cot^{-1}\left(\frac{1}{z}\right) - \pi ; |z| > 1 \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.17.27.0653.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{z} - 2 \cot^{-1}\left(\frac{1}{z}\right) ; |z| > 1$$

01.17.27.0654.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi\sqrt{z^2}}{2z} \left(1 - \frac{1-z}{1+z} \sqrt{\frac{(z+1)^2}{(z-1)^2}}\right) + \frac{2(1-z)}{1+z} \sqrt{\frac{(z+1)^2}{(z-1)^2}} \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\cot^{-1}(z')$

01.17.27.0655.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2 \cot^{-1}\left(\frac{z-1}{z^{z+1}} \sqrt{\frac{(z+1)^2}{(z-1)^2}}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\cot^{-1}(\sqrt{-z})$

01.17.27.0656.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \cot^{-1}(\sqrt{-z}) - \frac{\pi}{2} /; z \notin (0, \infty)$$

01.17.27.0657.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2 \cot^{-1}(\sqrt{-z}) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0658.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{1}{2}\pi \left(2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 2 \sqrt{-\frac{1}{z}} \sqrt{-z} - 1\right) + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \cot^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.0659.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2 \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; z \notin (1, \infty)$$

01.17.27.0660.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0661.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right) \pi - 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\cot^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.0662.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (0, \infty)$$

01.17.27.0663.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0664.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0665.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right) \pi - 2 \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\cot^{-1}(\sqrt{-z})$

01.17.27.0666.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \cot^{-1}(\sqrt{-z}) + \frac{\pi}{2} /; z \notin (0, \infty)$$

01.17.27.0667.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2 \cot^{-1}(\sqrt{-z}) + \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0668.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} \left(-2 \sqrt{\frac{1}{z}} \sqrt{-z} + 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} - 1\right) - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \cot^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.0669.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} + 2 \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; z \notin (1, \infty)$$

01.17.27.0670.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0671.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right) \pi + 2 \sqrt{1-z} \sqrt{\frac{1}{1-z}} \cot^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\cot^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.0672.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} + 2 \cot^{-1}\left(\sqrt{-\frac{1}{z}}\right) ; z \notin (0, \infty)$$

01.17.27.0673.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2 \cot^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0674.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2 \cot^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0675.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2}\right)\pi + 2\sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \cot^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0676.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \cot^{-1}(\sqrt{z}) - \frac{\pi}{2} ; |\arg(z)| < \pi$$

01.17.27.0677.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2 \cot^{-1}(\sqrt{z}) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0678.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \cot^{-1}(\sqrt{z}) + \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0679.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} \left(-2\sqrt{\frac{1}{z}} \sqrt{z} + 2\sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1\right) + 2\sqrt{\frac{1}{z+1}} \sqrt{z+1} \cot^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0680.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} - 2 \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) ; z \notin (-\infty, -1)$$

01.17.27.0681.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0682.01

$$\csc^{-1}\left(\frac{z+1}{1-z}\right) = \left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}}\right)\pi - 2\sqrt{z+1} \sqrt{\frac{1}{z+1}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0683.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} - 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0684.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0685.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0686.01

$$\csc^{-1}\left(\frac{z+1}{1-z}\right) = \left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}}\right)\pi - 2\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0687.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \cot^{-1}(\sqrt{z}) + \frac{\pi}{2}; |\arg(z)| < \pi$$

01.17.27.0688.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2 \cot^{-1}(\sqrt{z}) + \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0689.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} \left(-2\sqrt{\frac{1}{z}} \sqrt{z} + 2\sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1\right) - 2\sqrt{\frac{1}{z+1}} \sqrt{z+1} \cot^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0690.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} + 2 \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, -1)$$

01.17.27.0691.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0692.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}}\right)\pi + 2\sqrt{z+1} \sqrt{\frac{1}{z+1}} \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0693.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} + 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0694.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0695.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2 \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0696.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}}\right)\pi + 2\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$ and $\cot^{-1}(z)$

01.17.27.0697.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \cot^{-1}(z) - \frac{\pi}{2}; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0698.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = -2 \cot^{-1}(z) - \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0699.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \cot^{-1}(z) + \frac{3\pi}{2}; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0700.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{3\pi}{2} - 2 \cot^{-1}(z) ; (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0701.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \cot^{-1}(z) - \frac{\pi}{2} \left(2\sqrt{\frac{-i}{z}} \sqrt{iz} \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2\sqrt{\frac{i}{z}} \sqrt{-iz} \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right)$$

Involving $\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0702.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{\pi}{2} - 2 \cot^{-1}\left(\frac{1}{z}\right) ; \operatorname{Re}(z) > 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0703.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} ; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0704.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = -2 \cot^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2} ; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0705.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = 2 \cot^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2} ; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0706.01

$$\csc^{-1}\left(\frac{1+z^2}{1-z^2}\right) = \frac{\pi}{2} - \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z}\right) ; iz \notin (-\infty, -1) \wedge iz \notin (1, \infty)$$

01.17.27.0707.01

$$\csc^{-1}\left(\frac{z^2+1}{1-z^2}\right) = \frac{\pi}{2} \left(2\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + 2\sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 3 \right) - \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right)$

Involving $\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right)$ and $\cot^{-1}(z)$

01.17.27.0708.01

$$\csc^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \cot^{-1}(z) + \frac{\pi}{2} ; \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0709.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = 2 \cot^{-1}(z) + \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0710.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \cot^{-1}(z) - \frac{3\pi}{2}; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0711.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{3\pi}{2} + 2 \cot^{-1}(z); (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0712.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \cot^{-1}(z) + \frac{\pi}{2} \left(2 \sqrt{\frac{i}{z}} \sqrt{i z} \sqrt{\frac{1}{i z+1}} \sqrt{i z+1} + 2 \sqrt{\frac{i}{z}} \sqrt{-i z} \sqrt{\frac{1}{1-i z}} \sqrt{1-i z} - 3 \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0713.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} + 2 \cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0714.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \cot^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0715.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = 2 \cot^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2}; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0716.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -2 \cot^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2}; (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0717.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} + \frac{2\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z}\right); i z \notin (-\infty, -1) \wedge i z \notin (1, \infty)$$

01.17.27.0718.01

$$\operatorname{csc}^{-1}\left(\frac{z^2+1}{z^2-1}\right) = -\frac{\pi}{2} \left(2 \sqrt{\frac{1}{i z+1}} \sqrt{i z+1} + 2 \sqrt{\frac{1}{1-i z}} \sqrt{1-i z} - 3 \right) + \frac{2\sqrt{z^2}}{z} \sqrt{\frac{i-z}{i+z}} \sqrt{\frac{i+z}{i-z}} \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}(\sqrt{1+z})$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0719.01

$$\csc^{-1}(\sqrt{z+1}) = \cot^{-1}(\sqrt{z}) /; z \notin (-1, 0)$$

01.17.27.0720.01

$$\csc^{-1}(\sqrt{z+1}) = \cot^{-1}(\sqrt{z}) + \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0721.01

$$\csc^{-1}(\sqrt{z+1}) = \cot^{-1}(\sqrt{z}) - \frac{\pi}{2} \left(\sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right)$$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0722.01

$$\csc^{-1}(\sqrt{z+1}) = \frac{\pi}{2} - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}(\sqrt{1+z})$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0723.01

$$\csc^{-1}(\sqrt{z+1}) = \frac{\pi}{2} - \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; |\arg(z)| < \pi$$

01.17.27.0724.01

$$\csc^{-1}(\sqrt{z+1}) = \frac{\pi}{2} + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0725.01

$$\csc^{-1}(\sqrt{z+1}) = \frac{\pi}{2} - \sqrt{z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0726.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \frac{\pi}{2} - \cot^{-1}(\sqrt{z}) /; |\arg(z)| < \pi$$

01.17.27.0727.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = -\cot^{-1}(\sqrt{z}) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0728.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \cot^{-1}(\sqrt{z}) + \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0025.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \frac{\pi}{2} \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} - \sqrt{z+1} \sqrt{\frac{1}{z+1}} \cot^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0729.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, -1)$$

01.17.27.0730.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \pi - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0731.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \frac{1}{2} \left(\pi - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \left(\pi - 2 \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0732.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0733.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = -\cot^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0734.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \pi + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0735.01

$$\csc^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{z}}\right) = \frac{1}{2} \left(\pi - \sqrt{\frac{1}{z+1}} \sqrt{z+1} \left(\pi - 2 \sqrt{z} \sqrt{\frac{1}{z}} \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) \right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0736.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \frac{\pi}{2} - \cot^{-1}(\sqrt{z}) \ ; \ |\arg(z)| < \pi$$

01.17.27.0737.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \cot^{-1}(\sqrt{z}) + \frac{\pi}{2} \ ; \ (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0738.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \frac{\pi}{2} - \sqrt{\frac{1}{z}} \sqrt{z} \cot^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0739.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \ ; \ |\arg(z)| < \pi$$

01.17.27.0740.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = -\cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \ ; \ (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0741.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \pi - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right) \ ; \ (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0742.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \frac{1}{2}\pi \left(1 - \sqrt{\frac{1}{z+1}} \sqrt{z+1}\right) + \sqrt{\frac{1}{z}} \sqrt{z} \cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0743.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \cot^{-1}\left(\sqrt{\frac{1}{z}}\right) \ ; \ z \notin (-\infty, -1)$$

01.17.27.0744.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \pi + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0745.01

$$\csc^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{-z}}\right) = \frac{1}{2}\pi\left(1 - \sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\cot^{-1}(\sqrt{z})$

01.17.27.0746.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} - \cot^{-1}(\sqrt{z}); |\arg(z)| < \pi$$

01.17.27.0747.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \cot^{-1}(\sqrt{z}) + \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0024.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} - \sqrt{z}\sqrt{\frac{1}{z}}\cot^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0748.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.17.27.0749.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = -\cot^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0750.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \pi - \cot^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0751.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2}\left(1 - \sqrt{z+1}\sqrt{\frac{1}{z+1}}\right) + \sqrt{\frac{1}{z}}\sqrt{z}\cot^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0752.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-\infty, -1)$$

01.17.27.0753.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \pi + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0754.01

$$\csc^{-1}\left(\sqrt{\frac{z+1}{z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right) + \cot^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{a z^c + 1}\right)$

Involving $\csc^{-1}\left(\sqrt{a z^c + 1}\right)$ and $\cot^{-1}\left(\sqrt{a} z^{c/2}\right)$

01.17.27.0755.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = \cot^{-1}(z); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0756.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = -\cot^{-1}(z); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0757.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = \pi - \cot^{-1}(z); (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0758.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = \cot^{-1}(z) + \pi; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0026.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = \frac{\sqrt{z^2}}{z} \cot^{-1}(z); i z \notin (-1, 1)$$

01.17.27.0027.01

$$\csc^{-1}\left(\sqrt{z^2 + 1}\right) = \frac{\sqrt{z^2}}{z} \cot^{-1}(z) - \frac{\pi i}{2} \left(\frac{\sqrt{-i z - 1}}{\sqrt{i z + 1}} + \frac{\sqrt{i z - 1}}{\sqrt{1 - i z}}\right)$$

01.17.27.0028.01

$$\csc^{-1}\left(\sqrt{a z^c + 1}\right) = \frac{\sqrt{a} z^{c/2}}{\sqrt{a z^c}} \cot^{-1}\left(\sqrt{a} z^{c/2}\right) - \frac{\pi i}{2} \left(\frac{\sqrt{-i \sqrt{a} \sqrt{z^c} - 1}}{\sqrt{i \sqrt{a} \sqrt{z^c} + 1}} + \frac{\sqrt{i \sqrt{a} \sqrt{z^c} - 1}}{\sqrt{1 - i \sqrt{a} \sqrt{z^c}}}\right)$$

Involving $\csc^{-1}\left(\sqrt{1+z^2}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0759.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \frac{\pi}{2} - \cot^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0760.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0761.01

$$\csc^{-1}\left(\sqrt{z^2+1}\right) = \frac{\pi}{2} - \frac{\sqrt{z^2}}{z} \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\cot^{-1}(z)$

01.17.27.0762.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi}{2} - \cot^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0763.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\cot^{-1}(z) - \frac{\pi}{2} /; \operatorname{Re}(z) < 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0764.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \cot^{-1}(z) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0765.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \cot^{-1}(z) + \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0766.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi z}{2\sqrt{z^2+1}} \sqrt{1+\frac{1}{z^2}} - \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \cot^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0767.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \cot^{-1}\left(\frac{1}{z}\right); i z \notin (-\infty, -1) \wedge i z \notin (1, \infty)$$

01.17.27.0768.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \pi - \cot^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0769.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = -\cot^{-1}\left(\frac{1}{z}\right) - \pi; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0770.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{z}\right) = \frac{\pi}{2} \left(\sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - \sqrt{\frac{1}{iz+1}} \sqrt{iz+1} \right) + \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\cot^{-1}(z)$

01.17.27.0771.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} - \cot^{-1}(z); \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0772.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \cot^{-1}(z) + \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0773.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\cot^{-1}(z) - \frac{\pi}{2}; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0774.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \cot^{-1}(z) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0775.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{\sqrt{z^2+1}} \sqrt{\frac{z^2+1}{z^2}} \left(\frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \cot^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0776.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0777.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0778.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = -\cot^{-1}\left(\frac{1}{z}\right) + \pi; (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0779.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \cot^{-1}\left(\frac{1}{z}\right) + \pi; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0780.01

$$\csc^{-1}\left(\frac{\sqrt{z^2+1}}{\sqrt{z^2}}\right) = \frac{\sqrt{z^2}}{\sqrt{z^2+1}} \sqrt{\frac{z^2+1}{z^2}} \left(z \sqrt{\frac{1}{z^2}} \cot^{-1}\left(\frac{1}{z}\right) - \frac{1}{2} \pi \left(\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 2 \right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$ and $\cot^{-1}(z)$

01.17.27.0781.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \cot^{-1}(z) + \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0782.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - \cot^{-1}(z); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0783.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \cot^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0784.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = -\cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0785.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0786.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \cot^{-1}\left(\frac{1}{z}\right) + \pi; (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0787.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = \pi - \cot^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0788.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2-1}}{\sqrt{-z^2}}\right) = z \sqrt{\frac{1}{z^2}} \cot^{-1}\left(\frac{1}{z}\right) - \frac{1}{2} \pi \left(\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 2 \right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\cot^{-1}(z)$

01.17.27.0789.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi}{2} - \cot^{-1}(z); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0790.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \cot^{-1}(z) + \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0791.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \frac{\pi}{2} - z \sqrt{\frac{1}{z^2}} \cot^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0792.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0793.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = -\cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0794.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \pi - \cot^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0795.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = \pi + \cot^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0796.01

$$\csc^{-1}\left(\sqrt{\frac{z^2+1}{z^2}}\right) = z \sqrt{\frac{1}{z^2}} \cot^{-1}\left(\frac{1}{z}\right) - \frac{1}{2} \pi \left(\sqrt{\frac{1}{iz+1}} \sqrt{iz+1} + \sqrt{\frac{1}{1-iz}} \sqrt{1-iz} - 2 \right)$$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-1}\right)$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2}-1}\right)$ and $\cot^{-1}(z)$

01.17.27.0797.01

$$\csc^{-1}\left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}}\right) = \frac{\pi}{4} - \frac{1}{2} \cot^{-1}(z); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0798.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = \frac{\pi}{4} + \frac{1}{2} \cot^{-1}(z); \operatorname{Re}(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0799.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = -\frac{1}{2} \cot^{-1}(z) - \frac{\pi}{4}; (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0800.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = \frac{1}{2} \cot^{-1}(z) - \frac{\pi}{4}; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.0801.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = \frac{1}{4} \pi \sqrt{z^2} \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} - \frac{\sqrt{z^2}}{2z} \cot^{-1}(z)$$

Involving $\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right)$ and $\cot^{-1} \left(\frac{1}{z} \right)$

01.17.27.0802.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = \frac{1}{2} \cot^{-1} \left(\frac{1}{z} \right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0803.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = -\frac{1}{2} \cot^{-1} \left(\frac{1}{z} \right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0804.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (1+z^2)^{1/4}}{\sqrt{\sqrt{1+z^2}-1}} \right) = \frac{\sqrt{z^2}}{2z} \cot^{-1} \left(\frac{1}{z} \right)$$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2} - z}\right)$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2} - z}\right)$ and $\cot^{-1}(z)$

01.17.27.0805.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1} - z}}\right) = \frac{1}{2} \cot^{-1}(z) /; \operatorname{Re}(z) > 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1) \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.0806.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1} - z}}\right) = \frac{1}{2} \cot^{-1}(z) + \frac{\pi}{2} /; \operatorname{Re}(z) < 0 \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.0807.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1} - z}}\right) = \frac{1}{2} \cot^{-1}(z) - \frac{\pi}{4} \left(\frac{\sqrt{z^2}}{z} - 1\right) /; z \notin (-1, \infty)$$

01.17.27.0808.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1} - z}}\right) = \frac{\pi}{4} \left(-\sqrt{\frac{z}{z-i}} \sqrt{\frac{z-i}{z}} + \sqrt{\frac{z}{z+i}} \sqrt{\frac{z+i}{z}} - \frac{\sqrt{z^2}}{z} + 1\right) + \frac{1}{2} \sqrt{\frac{1}{1-i z}} \sqrt{1-i z} \cot^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{2} (1+z^2)^{1/4} / \sqrt{\sqrt{1+z^2} - z}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0809.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1} - z}}\right) = -\frac{1}{2} \cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4} /; i z \notin (1, \infty)$$

01.17.27.0810.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}}\right) = \frac{3\pi}{4} + \frac{1}{2}\cot^{-1}\left(\frac{1}{z}\right); (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0811.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2+1}}{\sqrt{\sqrt{z^2+1}-z}}\right) = -\frac{\sqrt{1-iz}}{2}\sqrt{\frac{1}{1-iz}}\cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4}\left(2 - \sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}}\right)$ and $\cot^{-1}(z)$

01.17.27.0812.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{\pi}{4} - \frac{1}{2}\cot^{-1}(z); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0813.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{1}{2}\cot^{-1}(z) + \frac{\pi}{4}; \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0814.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{\pi}{4} - \frac{1}{2}\sqrt{\frac{1}{z^2}}z\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\cot^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-1}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0815.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{1}{2}\cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.0816.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = -\frac{1}{2}\cot^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) < 0 \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.0817.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-1}}\right) = \frac{1}{2}\sqrt{\frac{1}{z^2}}z\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$ and $\cot^{-1}(z)$

01.17.27.0818.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\cot^{-1}(z); \operatorname{Re}(z) > 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1) \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.0819.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\cot^{-1}(z) + \frac{\pi}{2}; \operatorname{Re}(z) < 0 \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.0820.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{2} - \frac{1}{2}\cot^{-1}(z); (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.0821.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\cot^{-1}(z) - \frac{1}{4}\pi\left(\frac{\sqrt{z^2}}{z} - 1\right); iz \notin (-1, \infty)$$

01.17.27.0822.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{1}{2}\sqrt{\frac{1}{1-iz}}\sqrt{1-iz}\cot^{-1}(z) - \frac{1}{4}\pi\left(\sqrt{\frac{1}{z^2}}z - \sqrt{\frac{1}{iz+1}}\sqrt{iz+1} + \sqrt{\frac{1}{1-iz}}\sqrt{1-iz} - 1\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1+z^2}}{\sqrt{1+z^2}-z}}\right)$ and $\cot^{-1}\left(\frac{1}{z}\right)$

01.17.27.0823.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = -\frac{1}{2}\cot^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4}; i z \notin (1, \infty)$$

01.17.27.0824.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{3\pi}{4} + \frac{1}{2}\cot^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.0825.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2+1}}{\sqrt{z^2+1}-z}}\right) = \frac{\pi}{4}\left(-\sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}} + \sqrt{\frac{1}{iz+1}}\sqrt{iz+1} + 1\right) - \frac{1}{2}\sqrt{1-iz}\sqrt{\frac{1}{1-iz}}\cot^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{a z^c + 1}\right)$

Involving $\csc^{-1}\left(\sqrt{a z^c + 1}\right)$ and $\cot^{-1}\left(\sqrt{a} z^{c/2}\right)$

01.17.27.0826.01

$$\csc^{-1}\left(\sqrt{a z^c + 1}\right) = \frac{\sqrt{a} z^{c/2}}{\sqrt{a z^c}} \cot^{-1}\left(\sqrt{a} z^{c/2}\right) - \frac{1}{2}i\pi\left(\frac{\sqrt{-i\sqrt{a}\sqrt{z^c}-1}}{\sqrt{i\sqrt{a}\sqrt{z^c}+1}} + \frac{\sqrt{i\sqrt{a}\sqrt{z^c}-1}}{\sqrt{1-i\sqrt{a}\sqrt{z^c}}}\right)$$

Involving \sec^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\sec^{-1}(z)$

01.17.27.0029.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \sec^{-1}(z)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}(-z)$

01.17.27.0827.01

$$\csc^{-1}(z) = \sec^{-1}(-z) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2}{z^2-2}\right)$

01.17.27.0828.01

$$\csc^{-1}(z) = \frac{1}{2}\sec^{-1}\left(\frac{z^2}{z^2-2}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0829.01

$$\csc^{-1}(z) = -\frac{1}{2} \sec^{-1}\left(\frac{z^2}{z^2-2}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0830.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}} z \sec^{-1}\left(\frac{z^2}{z^2-2}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2}{2-z^2}\right)$

01.17.27.0831.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{1}{2} \sec^{-1}\left(\frac{z^2}{2-z^2}\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0832.01

$$\csc^{-1}(z) = \frac{1}{2} \sec^{-1}\left(\frac{z^2}{2-z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0833.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}} z \left(\pi - \sec^{-1}\left(\frac{z^2}{2-z^2}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$

01.17.27.0834.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right); z \notin (-1, 0)$$

01.17.27.0835.01

$$\csc^{-1}(z) = -\frac{3\pi}{2} + 2 \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0836.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2 \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right)$

01.17.27.0837.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$

01.17.27.0838.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sec^{-1}\left(\sqrt{\frac{2z}{z+1}}\right); z \notin (-1, 0)$$

01.17.27.0839.01

$$\csc^{-1}(z) = 2 \sec^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0840.01

$$\csc^{-1}(z) = \pi \left(\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} - \frac{1}{2} \right) - 2 \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \sec^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$

01.17.27.0841.01

$$\csc^{-1}(z) = 2 \sec^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$

01.17.27.0842.01

$$\csc^{-1}(z) = 2 \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) - \frac{\pi}{2}; z \notin (0, 1)$$

01.17.27.0843.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2 \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0844.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \right) + 2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \sec^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$

01.17.27.0845.01

$$\csc^{-1}(z) = 2 \sec^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) - \frac{\pi}{2}; z \notin (0, 1)$$

01.17.27.0846.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2 \sec^{-1}\left(\sqrt{\frac{2z}{z-1}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0847.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right) + 2 \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \sec^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\sqrt{z^2}\right)$

01.17.27.0848.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \sec^{-1}\left(\sqrt{z^2}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0849.01

$$\csc^{-1}(z) = \sec^{-1}\left(\sqrt{z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0850.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{z^2}\right)\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

01.17.27.0851.01

$$\csc^{-1}(z) = \sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right); \operatorname{Re}(z) > 0$$

01.17.27.0852.01

$$\csc^{-1}(z) = \sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) - \pi; \operatorname{Re}(z) < 0$$

01.17.27.0853.01

$$\csc^{-1}(z) = -\sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right); (iz \in \mathbb{R} \wedge iz < 0)$$

01.17.27.0854.01

$$\csc^{-1}(z) = \pi - \sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0855.01

$$\csc^{-1}(z) = \sqrt{\frac{1}{z^2}} \sqrt{z^2} \left(\frac{\pi}{2} \left(\frac{z}{\sqrt{z^2}} - 1\right) + \sec^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

01.17.27.0856.01

$$\csc^{-1}(z) = \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0857.01

$$\csc^{-1}(z) = -\sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0858.01

$$\csc^{-1}(z) = z \sqrt{\frac{1}{z^2}} \sec^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$

01.17.27.0859.01

$$\csc^{-1}(z) = \sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0860.01

$$\csc^{-1}(z) = -\sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0861.01

$$\csc^{-1}(z) = \pi - \sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0862.01

$$\csc^{-1}(z) = \sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0863.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - \sqrt{1 - \frac{1}{z^2}} z \sqrt{\frac{1}{z^2-1}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

01.17.27.0864.01

$$\csc^{-1}(z) = \sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0865.01

$$\csc^{-1}(z) = -\sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0866.01

$$\csc^{-1}(z) = \pi - \sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0867.01

$$\csc^{-1}(z) = \sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0868.01

$$\csc^{-1}(z) = \frac{\pi}{2} \sqrt{\frac{1}{z}} \sqrt{z} \left(\sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{\frac{1}{z-1}} \sqrt{z-1} \right) + \sqrt{\frac{1}{z-1}} \sqrt{z-1} z \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \sec^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\sec^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right)$

01.17.27.0869.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{2z} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) \right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0870.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{z}{\sqrt{\frac{1-z^2}{z^2}}} \sqrt{\frac{1-z^2}{z^4}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-1}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) \right) \right)$$

Involving $\csc^{-1}(\sqrt{z})$

Involving $\csc^{-1}(\sqrt{z})$ and $\sec^{-1}(\sqrt{z})$

01.17.27.0871.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \sec^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{z})$ and $\sec^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.17.27.0872.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \sec^{-1}\left(1/\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0873.01

$$\csc^{-1}(\sqrt{z}) = \sec^{-1}\left(1/\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0874.01

$$\csc^{-1}(\sqrt{z}) = \sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(1/\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0875.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0876.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); z \notin (-\infty, 0)$$

01.17.27.0877.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0878.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \left(\frac{\pi}{2} - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{z^2}\right)$ and $\sec^{-1}(z)$

01.17.27.0879.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \frac{\pi}{2} - \sec^{-1}(z) \text{ ; } -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0880.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \sec^{-1}(z) - \frac{\pi}{2} \text{ ; } \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0881.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \sec^{-1}(z) \right)$$

Involving $\csc^{-1}\left(a\left(bz^c\right)^m\right)$

Involving $\csc^{-1}\left(a\left(bz^c\right)^m\right)$ and $\sec^{-1}\left(ab^m z^{mc}\right)$

01.17.27.0882.01

$$\csc^{-1}\left(a\left(bz^c\right)^m\right) = \frac{\left(bz^c\right)^m}{b^m z^{mc}} \left(\frac{\pi}{2} - \sec^{-1}\left(ab^m z^{mc}\right) \right) \text{ ; } 2m \in \mathbb{Z}$$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0883.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2 \sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} \text{ ; } -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0884.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{3\pi}{2} - 2 \sec^{-1}\left(\frac{1}{z}\right) \text{ ; } \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0885.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{\pi}{2} \left(1 - \frac{2\sqrt{z^2}}{z} \right) + \frac{2\sqrt{z^2}}{z} \sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0886.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -2 \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0887.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -\frac{3\pi}{2} + 2 \sec^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0888.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = \frac{\pi}{2} \left(\frac{2\sqrt{z^2}}{z} - 1 \right) - \frac{2\sqrt{z^2}}{z} \sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$ and $\sec^{-1}(z)$

01.17.27.0889.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = -\frac{\pi}{2} + 2 \sec^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0890.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{3\pi}{2} - 2 \sec^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0891.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{\pi}{2} \left(1 - 2z \sqrt{\frac{1}{z^2}} \right) + 2z \sqrt{\frac{1}{z^2}} \sec^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2}{2-z^2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{2-z^2}\right)$ and $\sec^{-1}(z)$

01.17.27.0892.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = \frac{\pi}{2} - 2 \sec^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0893.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = -\frac{3\pi}{2} + 2 \sec^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0894.01

$$\csc^{-1}\left(\frac{z^2}{2-z^2}\right) = \frac{\pi}{2} \left(2z \sqrt{\frac{1}{z^2} - 1} \right) - 2z \sqrt{\frac{1}{z^2}} \sec^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0895.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0896.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.0897.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \pi - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0898.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{1}{2} \pi \left(1 - \sqrt{z} \sqrt{\frac{1}{z}} \right) + \sqrt{\frac{1}{z}} \sqrt{z} \sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.0899.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \sec^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (1, \infty)$$

01.17.27.0900.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\sec^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0901.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \sqrt{1-z} \sqrt{\frac{1}{1-z}} \sec^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.0902.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; z \notin (1, \infty) \wedge z \notin (-\infty, 0)$$

01.17.27.0903.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0904.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \pi - \sec^{-1}\left(\sqrt{\frac{1}{z}}\right) /; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0905.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{1}{2}\pi \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) + \sqrt{\frac{z}{1-z}} \sqrt{\frac{1-z}{z}} \sec^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0906.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{1}{2} \sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0907.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2} \left(\pi - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0908.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{1}{2} \sec^{-1}\left(\frac{1}{z}\right); z \notin (1, \infty)$$

01.17.27.0909.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{1}{2} \sec^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0910.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{1}{2} \sqrt{1-z} \sqrt{\frac{1}{1-z}} \sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0911.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} \left(\pi - \sec^{-1}\left(\frac{1}{z}\right)\right); z \notin (-\infty, -1)$$

01.17.27.0912.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} \left(\sec^{-1}\left(\frac{1}{z}\right) - \pi\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0913.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\pi - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}(\sqrt{z})$

01.17.27.0914.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \sec^{-1}(\sqrt{z}); |\arg(z)| < \pi$$

01.17.27.0915.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \pi - \sec^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0030.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \sec^{-1}(\sqrt{z})\sqrt{\frac{1}{z}}\sqrt{z} + \frac{\pi}{2}\left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}(\sqrt{z})$

01.17.27.0916.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \sec^{-1}(\sqrt{z}) ; z \notin (-\infty, 1)$$

01.17.27.0917.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\sec^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0918.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \pi - \sec^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0919.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \sqrt{\frac{z-1}{z}}\sqrt{\frac{z}{z-1}}\left(\frac{1}{2}\pi\left(1 - \sqrt{\frac{1}{z}}\sqrt{z}\right) + \sqrt{\frac{1}{z}}\sqrt{z}\sec^{-1}(\sqrt{z})\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\sec^{-1}(\sqrt{z})$

01.17.27.0920.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \sec^{-1}(\sqrt{z}) ; 0 < |\arg(z)| < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0921.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\sec^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0922.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \pi - \sec^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0923.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \sqrt{z-1}\sqrt{\frac{1}{z-1}}\sec^{-1}(\sqrt{z}) + \frac{\pi}{2}\left(1 - \sqrt{z}\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+c}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0031.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{1}{2} \sec^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0924.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} (\pi - \sec^{-1}(z)) ; z \notin (-1, 0)$$

01.17.27.0925.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \sec^{-1}(z) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0926.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} (\pi - \sec^{-1}(z))$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{a-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$ and $\sec^{-1}(z)$

01.17.27.0927.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sec^{-1}(z) ; z \notin (0, 1)$$

01.17.27.0928.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \sec^{-1}(z) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0929.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \sec^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right)$ and $\sec^{-1}(z)$

01.17.27.0930.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2}(\pi - \sec^{-1}(z))$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+a}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0931.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2}\sec^{-1}(z) ; z \notin (0, 1)$$

01.17.27.0932.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2}\sec^{-1}(z) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0933.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2}\sqrt{\frac{z-1}{z}}\sqrt{\frac{z}{z-1}}\sec^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0934.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}(\pi - \sec^{-1}(z)) ; z \notin (-1, 0)$$

01.17.27.0935.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}(\sec^{-1}(z) - \pi) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0936.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}\sqrt{\frac{z+1}{z}}\sqrt{\frac{z}{z+1}}(\pi - \sec^{-1}(z))$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0937.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0938.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi - \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0939.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\sqrt{z^2}}{z} \sec^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0940.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \sec^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0941.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi - \sec^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0942.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\sec^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0943.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \sec^{-1}\left(\frac{1}{z}\right) - \pi; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0944.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} \left(\frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{\sqrt{z^2}}{z} \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0945.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \sec^{-1}(z) ; \operatorname{Re}(z) > 0$$

01.17.27.0946.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \sec^{-1}(z) - \pi ; \operatorname{Re}(z) < 0$$

01.17.27.0947.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \pi - \sec^{-1}(z) ; (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.0948.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -\sec^{-1}(z) ; (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.0949.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1 \right) + \sec^{-1}(z) ; \operatorname{Re}(z) \neq 0$$

01.17.27.0950.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2}}{2z} \left(2z \sqrt{\frac{1}{z^2}} \sec^{-1}(z) - \pi \sqrt{\frac{1}{z^2}} z + \pi \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0951.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \sec^{-1}(z) ; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0952.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \pi - \sec^{-1}(z) ; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0953.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z^2}} z\right) + z \sqrt{\frac{1}{z^2}} \sec^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\sec^{-1}(z)$

01.17.27.0954.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sec^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0955.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \pi - \sec^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0956.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -\sec^{-1}(z) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0957.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sec^{-1}(z) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0958.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sqrt{1 - \frac{1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \left(\frac{1}{2} \pi \left(1 - \sqrt{\frac{1}{z^2}} z\right) + z \sqrt{\frac{1}{z^2}} \sec^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0959.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \sec^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0960.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \pi - \sec^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0961.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\pi + \sec^{-1}(z) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0962.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -\sec^{-1}(z) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0963.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\sqrt{-z^2} \sqrt{z^2-1}}{2\sqrt{z^2-z^4}} \left(2z \sqrt{\frac{1}{z^2}} \sec^{-1}(z) - \pi \sqrt{\frac{1}{z^2}} z + \pi \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0964.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2 \sec^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.27.0965.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \frac{\pi \sqrt{1-2z^2} \sqrt{z^4-z^2}}{2\sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{\sqrt{2}z+1}} \sqrt{\sqrt{2}z+1} + \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-\sqrt{2}z}} \sqrt{1-\sqrt{2}z} + \frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}} - 2 \right) + \frac{2\sqrt{1-2z^2} \sqrt{z^4-z^2}}{\sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \sec^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0966.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \pi - 2 \sec^{-1}(z) /; \frac{\pi}{4} \leq |\arg(z)| < \frac{\pi}{2} \vee |z| \geq \sqrt{2} \wedge |\arg(z)| < \frac{\pi}{4}$$

01.17.27.0967.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = \frac{\sqrt{z^2}}{z} (\pi - 2 \sec^{-1}(z)) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.0968.01

$$\begin{aligned} \csc^{-1}\left(\frac{z^2}{2\sqrt{z^2-1}}\right) = & \\ & - \frac{z^3 \sqrt{z^2-2} \sqrt{z^2-1}}{2\sqrt{1-z} (z+1) \sqrt{-z^4+3z^2-2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{\frac{1}{z}} \sqrt{\frac{z+1}{z}} \left(\pi \left(\frac{z^3}{1-z^2} \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}} z - \right. \right. \\ & \left. \left. \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}} \sqrt{\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} - 2 \right) + 4 \sec^{-1}(z) \right) \end{aligned}$$

Involving $\csc^{-1}\left(\sqrt{2} / \sqrt{1 - \sqrt{1 - z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{2} / \sqrt{1 - \sqrt{1 - z^2}}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0969.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 - z^2}}}\right) = \frac{1}{2} \left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right) \right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0970.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 - z^2}}}\right) = \frac{1}{2} \left(\sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} \right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.0971.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{z}{2\sqrt{z^2}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\left(1-\sqrt{1-z^2}\right)\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\left(1-\sqrt{1-z^2}\right)\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0972.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0973.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\sec^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0974.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{z}{2}\sqrt{\frac{1}{z^2}}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0975.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1-z^2})}\right)$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1-z^2})}\right)$ and $\sec^{-1}\left(\frac{1}{z}\right)$

01.17.27.0976.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \sec^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{2z}/\sqrt{z-\sqrt{z^2-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{2z}/\sqrt{z-\sqrt{z^2-1}}\right)$ and $\sec^{-1}(z)$

01.17.27.0977.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \sec^{-1}(z)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0978.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - \sec^{-1}(z)\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0979.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\sec^{-1}(z) - \frac{3\pi}{2}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.0980.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\sec^{-1}(z) + \frac{\pi}{2}\right); (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0981.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{1}{2} \sqrt{-iz} \sqrt{-\frac{1}{iz}} \left(\frac{\pi}{2} - \sec^{-1}(z) \right) - \frac{1}{4} \pi \left(\frac{\sqrt{z^2}}{z} - 1 \right) \right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{z^2-1})}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{z^2-1})}\right)$ and $\sec^{-1}(z)$

01.17.27.0982.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2} \left(\frac{\pi}{2} - \sec^{-1}(z) \right) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.0983.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2} \left(\frac{3\pi}{2} - \sec^{-1}(z) \right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0984.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2} \left(\sec^{-1}(z) + \frac{\pi}{2} \right) /; (iz \in \mathbb{R} \wedge iz > 0)$$

01.17.27.0985.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{\sqrt{iz}}{2} \sqrt{-\frac{i}{z}} \left(\sqrt{z^2} \sqrt{\frac{1}{z^2}} \left(\frac{\pi}{2} - \sec^{-1}(z) \right) - \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1 \right) \right)$$

Involving \sinh^{-1}

Involving $\operatorname{csc}^{-1}(z)$

Involving $\operatorname{csc}^{-1}(z)$ and $\sinh^{-1}\left(\frac{i}{z}\right)$

01.17.27.0986.01

$$\operatorname{csc}^{-1}(z) = -i \sinh^{-1}\left(\frac{i}{z}\right)$$

Involving $\operatorname{csc}^{-1}(z)$ and $\sinh^{-1}\left(i \frac{2-z^2}{z^2}\right)$

01.17.27.0987.01

$$\csc^{-1}(z) = \frac{1}{2} \left(\frac{\pi}{2} - i \sinh^{-1} \left(\frac{i(2-z^2)}{z^2} \right) \right) /; -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.0988.01

$$\csc^{-1}(z) = \frac{1}{2} \left(i \sinh^{-1} \left(\frac{i(2-z^2)}{z^2} \right) - \frac{\pi}{2} \right) /; \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.0989.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}} z \left(\frac{\pi}{2} - i \sinh^{-1} \left(\frac{i(2-z^2)}{z^2} \right) \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{i\sqrt{z-1}}{\sqrt{2z}} \right)$

01.17.27.0990.01

$$\csc^{-1}(z) = 2 i \sinh^{-1} \left(\frac{i\sqrt{z-1}}{\sqrt{2z}} \right) + \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{2z}} \right)$

01.17.27.0991.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 i \sinh^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{2z}} \right) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0992.01

$$\csc^{-1}(z) = 2 i \sinh^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{2z}} \right) + \frac{\pi}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0993.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{2\sqrt{z-1}}{\sqrt{1-z}} \sinh^{-1} \left(\frac{\sqrt{1-z}}{\sqrt{2z}} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{-2z}} \right)$

01.17.27.0994.01

$$\csc^{-1}(z) = -2 i \sinh^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{-2z}} \right) + \frac{\pi}{2} /; -\pi < \arg(z) \leq 0$$

01.17.27.0995.01

$$\csc^{-1}(z) = 2 i \sinh^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{-2z}} \right) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.0996.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{2\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-2z}}\right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$

01.17.27.0997.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0998.01

$$\csc^{-1}(z) = \frac{\pi}{2} + 2i \sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0999.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{2\sqrt{z-1}\sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \sinh^{-1}\left(\sqrt{\frac{1-z}{2z}}\right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2z}}\right)$

01.17.27.1000.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1001.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \sinh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{2z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1002.01

$$\csc^{-1}(z) = -\frac{2\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-2z}}\right)$

01.17.27.1003.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \sinh^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-2z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1004.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \sinh^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{-2z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.17.27.1005.01

$$\csc^{-1}(z) = \frac{2\sqrt{-(z+1)^2}}{z+1} \sinh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{-2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{-\frac{1+z}{2z}}\right)$

01.17.27.1006.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \sinh^{-1}\left(\sqrt{-\frac{1+z}{2z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 0) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1007.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \sinh^{-1}\left(\sqrt{-\frac{1+z}{2z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1008.01

$$\csc^{-1}(z) = \frac{2\sqrt{-z-1}\sqrt{-z}}{\sqrt{z+1}} \sqrt{-\frac{1}{z}} \sinh^{-1}\left(\sqrt{-\frac{z+1}{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$

01.17.27.1009.01

$$\csc^{-1}(z) = -i \sinh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1010.01

$$\csc^{-1}(z) = i \sinh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1011.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{1}{\sqrt{-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right)$

01.17.27.1012.01

$$\csc^{-1}(z) = -i \sinh^{-1}\left(\sqrt{-\frac{1}{z^2}}\right); 0 \leq \arg(z) < \pi$$

01.17.27.1013.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\sqrt{-\frac{1}{z^2}} \right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1014.01

$$\csc^{-1}(z) = -z \sqrt{-\frac{1}{z^2}} \sinh^{-1} \left(\sqrt{-\frac{1}{z^2}} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right)$

01.17.27.1015.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1016.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right) + \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1017.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right) - \frac{\pi}{2} /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1018.01

$$\csc^{-1}(z) = -i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1019.01

$$\csc^{-1}(z) = -\frac{i \sqrt{-\frac{i}{z}}}{\sqrt{\frac{i}{z}}} \left(\frac{z \sqrt{z^2-1}}{\sqrt{z^2} \sqrt{1-z^2}} \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{z} \right) - \frac{\pi}{2} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right)$

01.17.27.1020.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1021.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \quad \bigvee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1022.01

$$\csc^{-1}(z) = -i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \quad \bigvee \quad (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1023.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge -1 < z < 0) \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.1024.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - z \sqrt{\frac{1}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{z^2} \sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} \sinh^{-1} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2}} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right)$

01.17.27.1025.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right) + \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1026.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1027.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1028.01

$$\csc^{-1}(z) = -i \sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.1029.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - \frac{\sqrt{-z^4}}{z} \sqrt{\frac{1}{z^2}} \sinh^{-1} \left(\frac{\sqrt{z^2-1}}{\sqrt{-z^2}} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right)$

01.17.27.1030.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right); 0 < \arg(z) < \frac{\pi}{2} \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1031.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right) + \frac{\pi}{2}; -\frac{\pi}{2} \leq \arg(z) < 0 \quad (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1032.01

$$\csc^{-1}(z) = -i \sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right) - \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) < \pi \quad (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1033.01

$$\csc^{-1}(z) = i \sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right) - \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \quad (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1034.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} - \frac{1}{z^2}} - \sqrt{-\frac{1}{z^2}} z \sqrt{\frac{1-z}{1+z}} \sqrt{\frac{1+z}{1-z}} \sinh^{-1} \left(\sqrt{\frac{1-z^2}{z^2}} \right)$$

Involving $\csc^{-1}(z)$ and $\sinh^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2} \right)$

01.17.27.1035.01

$$\csc^{-1}(z) = -\frac{\sqrt{z^2} \sqrt{1-z^2}}{2z \sqrt{z^2-1}} \sinh^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2} \right); \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \quad (|z| \geq \sqrt{2})$$

01.17.27.1036.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{\sqrt{\frac{1-z^2}{z^4}} z}{\sqrt{\frac{1-z^2}{z^2}}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{1-z^2}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \sinh^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2} \right) \right)$$

Involving $\csc^{-1}(iz)$

Involving $\csc^{-1}(iz)$ and $\sinh^{-1} \left(\frac{1}{z} \right)$

01.17.27.1037.01

$$\csc^{-1}(iz) = -i \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}(\sqrt{cz})$

Involving $\csc^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.1038.01

$$\csc^{-1}(\sqrt{z}) = -i \sinh^{-1}\left(\frac{1}{\sqrt{-z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1039.01

$$\csc^{-1}(\sqrt{z}) = i \sinh^{-1}\left(\frac{1}{\sqrt{-z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1040.01

$$\csc^{-1}(\sqrt{z}) = -\frac{\sqrt{z}}{\sqrt{-z}} \sinh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}(\sqrt{z})$ and $\sinh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.1041.01

$$\csc^{-1}(\sqrt{z}) = -i \sinh^{-1}\left(\sqrt{-\frac{1}{z}}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.1042.01

$$\csc^{-1}(\sqrt{z}) = i \sinh^{-1}\left(\sqrt{-\frac{1}{z}}\right); \operatorname{Im}(z) < 0$$

01.17.27.1043.01

$$\csc^{-1}(\sqrt{z}) = -\sqrt{z} \sqrt{-\frac{1}{z}} \sinh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1044.01

$$\csc^{-1}(\sqrt{-z}) = i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1045.01

$$\csc^{-1}(\sqrt{-z}) = -i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1046.01

$$\csc^{-1}(\sqrt{-z}) = -\frac{\sqrt{-z}}{\sqrt{z}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1047.01

$$\csc^{-1}(\sqrt{-z}) = i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.17.27.1048.01

$$\csc^{-1}(\sqrt{-z}) = -i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.1049.01

$$\csc^{-1}(\sqrt{-z}) = -\sqrt{-z} \sqrt{\frac{1}{z}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\sinh^{-1}(\sqrt{-z})$

01.17.27.1050.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \sinh^{-1}(\sqrt{-z}); 0 < \arg(z) \leq \pi$$

01.17.27.1051.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \sinh^{-1}(\sqrt{-z}); -\pi < \arg(z) \leq 0$$

01.17.27.1052.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\sqrt{z}}{\sqrt{-z}} \sinh^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.17.27.1053.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \sinh^{-1}(\sqrt{z}); 0 < \arg(z) \leq \pi$$

01.17.27.1054.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \sinh^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.17.27.1055.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z}}{\sqrt{z}} \sinh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{c z^2})$

Involving $\csc^{-1}(\sqrt{z^2})$ and $\sinh^{-1}(\frac{i}{z})$

01.17.27.1056.01

$$\csc^{-1}(\sqrt{z^2}) = -i \sinh^{-1}\left(\frac{i}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1057.01

$$\csc^{-1}(\sqrt{z^2}) = i \sinh^{-1}\left(\frac{i}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1058.01

$$\csc^{-1}(\sqrt{z^2}) = -\frac{i\sqrt{z^2}}{z} \sinh^{-1}\left(\frac{i}{z}\right)$$

Involving $\csc^{-1}(\sqrt{-z^2})$ and $\sinh^{-1}(\frac{1}{z})$

01.17.27.1059.01

$$\csc^{-1}(\sqrt{-z^2}) = i \sinh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1060.01

$$\csc^{-1}(\sqrt{-z^2}) = -i \sinh^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1061.01

$$\csc^{-1}(\sqrt{-z^2}) = -\frac{\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}(a(b z^c)^m)$

Involving $\csc^{-1}(a(b z^c)^m)$ and $\sinh^{-1}(\frac{i}{a} b^{-m} z^{-mc})$

01.17.27.1062.01

$$\csc^{-1}(a(b z^c)^m) = -\frac{i(b z^c)^m}{b^m z^{mc}} \sinh^{-1}\left(\frac{i}{a} b^{-m} z^{-mc}\right); 2m \in \mathbb{Z}$$

Involving $\csc^{-1}\left(\frac{1}{1+2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1+2z^2}\right)$ and $\sinh^{-1}(z)$

01.17.27.1063.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = \frac{\pi}{2} - 2i \sinh^{-1}(z) /; -\pi < \arg(z) \leq 0$$

01.17.27.1064.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = 2i \sinh^{-1}(z) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.1065.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = \frac{\pi}{2} - \frac{2\sqrt{-z^2}}{z} \sinh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2+2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2+2}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1066.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = \frac{\pi}{2} - 2i \sinh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \pi$$

01.17.27.1067.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = 2i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1068.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = \frac{\pi}{2} - 2z \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.17.27.1069.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - i \sinh^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.17.27.1070.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = i \sinh^{-1}(\sqrt{z}) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.0032.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \sinh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\sinh^{-1}(\sqrt{z})$

01.17.27.1071.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \frac{\pi}{2} - i \sinh^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.17.27.1072.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = i \sinh^{-1}(\sqrt{z}) + \frac{\pi}{2} /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1073.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = -i \sinh^{-1}(\sqrt{z}) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1074.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \sinh^{-1}(\sqrt{z}) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\sinh^{-1}(iz)$

01.17.27.1075.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{1}{2} \left(\frac{\pi}{2} + i \sinh^{-1}(iz) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+z}}\right)$ and $\sinh^{-1}(iz)$

01.17.27.1076.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2} \left(\frac{\pi}{2} - i \sinh^{-1}(iz) \right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\sinh^{-1}(iz)$

01.17.27.1077.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{i}{2} \sinh^{-1}(iz) + \frac{\pi}{4} /; z \notin (1, \infty)$$

01.17.27.1078.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{1}{2} i \sinh^{-1}(iz) - \frac{\pi}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1079.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{1}{2} \sqrt{1-z} \sqrt{\frac{1}{1-z}} \left(i \sinh^{-1}(iz) + \frac{\pi}{2} \right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\sinh^{-1}(iz)$

01.17.27.1080.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} \left(\frac{\pi}{2} - i \sinh^{-1}(iz) \right) /; z \notin (-\infty, -1)$$

01.17.27.1081.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right) = \frac{1}{2} i \sinh^{-1}(iz) - \frac{\pi}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1082.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{\sqrt{z+1}}{2} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - i \sinh^{-1}(iz) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1083.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1084.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0$$

01.17.27.1085.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1086.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{\sqrt{-z-1} \sqrt{z}} \left(\frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) \right)$$

01.17.27.1087.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{\pi}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{z}{z+1} \sqrt{-\frac{(z+1)^2}{z^2}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1088.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.17.27.1089.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1090.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = -i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1091.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{\sqrt{-z-1} \sqrt{z}} \left(\frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1092.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.17.27.1093.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} + i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) < 0$$

01.17.27.1094.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - \sqrt{-\frac{1}{z}} \sqrt{z} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1095.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.17.27.1096.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} + i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1097.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{1+z}}\right)$ and $\sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1098.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1099.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0$$

01.17.27.1100.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = i \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1101.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sqrt{\frac{z}{1+z}} \sqrt{\frac{1+z}{z}} \left(\frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right) \right)$$

01.17.27.1102.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \frac{\pi}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{z}{z+1} \sqrt{-\frac{(z+1)^2}{z^2}} \sinh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{1+z}}\right)$ and $\sinh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1103.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; 0 \leq \arg(z) < \pi$$

01.17.27.1104.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1105.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -i \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1106.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sqrt{\frac{z}{1+z}} \sqrt{\frac{1+z}{z}} \left(\frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \sinh^{-1}\left(\sqrt{\frac{1}{z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+az^c}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{az^c+1}}\right)$ and $\sinh^{-1}(\sqrt{a} z^{c/2})$

01.17.27.1107.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \sinh^{-1}(z) /; -\pi < \arg(z) \leq 0$$

01.17.27.1108.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = i \sinh^{-1}(z) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.0033.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{z}{\sqrt{-z^2}} \sinh^{-1}(z) + \frac{\pi}{2}$$

01.17.27.0034.01

$$\operatorname{csc}^{-1}\left(\frac{1}{\sqrt{a z^c + 1}}\right) = \frac{\sqrt{a} z^{c/2}}{\sqrt{-a z^c}} \sinh^{-1}(\sqrt{a} z^{c/2}) + \frac{\pi}{2}$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$ and $\sinh^{-1}(z)$

01.17.27.1109.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2 + 1}}\right) = \frac{\pi}{2} - i \sinh^{-1}(z) /; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) \leq 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.1110.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2 + 1}}\right) = i \sinh^{-1}(z) + \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) \leq \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.1111.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2 + 1}}\right) = i \sinh^{-1}(z) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.1112.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2 + 1}}\right) = -i \sinh^{-1}(z) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.1113.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{z}{\sqrt{-z^2}} \sinh^{-1}(z) + \frac{\pi}{2} \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1114.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.1115.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.1116.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.1117.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.1118.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi \sqrt{z^2}}{2z} - \sqrt{-\frac{1}{z^2}} \sqrt{z^2} \sinh^{-1}\left(\frac{1}{z}\right) /; i z \notin (-1, 1)$$

01.17.27.1119.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2+1}}{z^2 \sqrt{-\frac{z^2+1}{z^4}}} \left(\frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} + \sinh^{-1}\left(\frac{1}{z}\right) \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1120.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.1121.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1122.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.1123.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.1124.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) = \frac{\sqrt{-z^2(z^2+1)}}{\sqrt{z^2}\sqrt{-z^2-1}} \left(\frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \sinh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1125.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \pi$$

01.17.27.1126.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1127.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \sinh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1128.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{\pi}{2} - i \sinh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.1129.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1130.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.1131.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -i \sinh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.1132.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -z \sqrt{\frac{z^2}{z^2+1}} \sqrt{-\frac{z^2+1}{z^4}} \left(\sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right)$ and $\sinh^{-1}(z)$

01.17.27.1133.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right) = \frac{2\sqrt{-z^4}}{z^2} \sinh^{-1}(z) /; |\arg(z)| \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq |\arg(z)| \leq \pi$$

01.17.27.1134.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right) = \frac{\pi\sqrt{2z^2+1}\sqrt{z^4+z^2}}{2\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{z^2+1}} \left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}z}}\sqrt{1-i\sqrt{2}z} + i\sqrt{\frac{-i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}iz+1}}\sqrt{\sqrt{2}iz+1} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}} \right) - \frac{2\sqrt{2z^2+1}\sqrt{z^4+z^2}}{\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{z^2+1}} \sinh^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1135.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right) = \frac{2\sqrt{-z^2}}{z} \sinh^{-1}\left(\frac{1}{z}\right) /; |\arg(z)| \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq |\arg(z)| \leq \pi \vee |z| \geq \sqrt{2}$$

01.17.27.1136.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right) = \frac{z^3\sqrt{-z^2-2}\sqrt{-z^2-1}}{2\sqrt{1-iz}(iz+1)\sqrt{-z^4-3z^2-2}}\sqrt{\frac{z^2+1}{z^4}}\sqrt{\frac{i-z}{z}}\sqrt{-\frac{i}{z}}\left(\pi\left(-\frac{z^3}{z^2+1}\sqrt{-\frac{z^2+1}{z^2}}\sqrt{\frac{z^2+1}{z^4}}+\sqrt{-\frac{1}{z^2}}z+i\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{z}{-i\sqrt{2}+z}}-i\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{z}{i\sqrt{2}+z}}\right)+4\sinh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1+z^2}}\right)$ and $\sinh^{-1}(z)$

01.17.27.1137.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = \frac{i}{2}\sinh^{-1}(z); -\pi < \arg(z) \leq 0$$

01.17.27.1138.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\sinh^{-1}(z); 0 < \arg(z) \leq \pi$$

01.17.27.1139.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = \frac{\sqrt{-z^2}}{2z}\sinh^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2/\left(1-\sqrt{1+z^2}\right)}\right)$

Involving $\csc^{-1}\left(\sqrt{2/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\sinh^{-1}(z)$

01.17.27.1140.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2} (i \sinh^{-1}(z)) ; 0 \leq \arg(z) < \pi$$

01.17.27.1141.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = \frac{1}{2} i \sinh^{-1}(z) ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1142.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2} \sqrt{-\frac{1}{z^2}} z \sinh^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1+z^2}}\right)\right)$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1+z^2}}\right)\right)$ and $\sinh^{-1}(z)$

01.17.27.1143.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2} i \sinh^{-1}(z) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1144.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2} i \sinh^{-1}(z) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1145.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\sqrt{-z^4}}{2z^2} \sinh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1+z^2})}\right)$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1+z^2})}\right)$ and $\sinh^{-1}(z)$

01.17.27.1146.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = \frac{1}{2}i\sinh^{-1}(z); 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.1147.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\sinh^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee \operatorname{Im}(z) = 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 1)$$

01.17.27.1148.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}}\sinh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right)$ and $\sinh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1149.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i\sinh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.1150.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\sinh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.1151.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{\pi}{2} - \frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.1152.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1153.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{z^2}{2} \sqrt{-\frac{1}{z^4}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \sinh^{-1}\left(\frac{1}{z}\right) + \frac{1}{4}\pi \left(1 - z \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{1+z^2})}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{1+z^2})}\right)$ and $\sinh^{-1}(1/z)$

01.17.27.1154.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.1155.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.1156.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{\pi}{2} - \frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.1157.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \sinh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1158.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{z}}(-z)^{3/2}\sqrt{\frac{1}{1+z^2}}\sqrt{1+z^2}\sinh^{-1}\left(\frac{1}{z}\right) + \frac{1}{4}\pi\left(1-z\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\right)$$

Involving \cosh^{-1}

Involving $\operatorname{csc}^{-1}(z)$

Involving $\operatorname{csc}^{-1}(z)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1159.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - i \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1160.01

$$\operatorname{csc}^{-1}(z) = i \cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1161.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - \frac{\sqrt{1 - \frac{1}{z}}}{\sqrt{\frac{1}{z} - 1}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}(z)$ and $\cosh^{-1}\left(-\frac{1}{z}\right)$

01.17.27.1162.01

$$\operatorname{csc}^{-1}(z) = -i \cosh^{-1}\left(-\frac{1}{z}\right) - \frac{\pi}{2}; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1163.01

$$\operatorname{csc}^{-1}(z) = i \cosh^{-1}\left(-\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1164.01

$$\operatorname{csc}^{-1}(z) = \frac{\sqrt{1 + \frac{1}{z}}}{\sqrt{-\frac{z+1}{z}}} \cosh^{-1}\left(-\frac{1}{z}\right) - \frac{\pi}{2}$$

Involving $\operatorname{csc}^{-1}(z)$ and $\cosh^{-1}\left(\frac{z^2-2}{z^2}\right)$

01.17.27.1165.01

$$\operatorname{csc}^{-1}(z) = -\frac{1}{2}i \cosh^{-1}\left(\frac{z^2-2}{z^2}\right); 0 \leq \arg(z) < \pi$$

01.17.27.1166.01

$$\csc^{-1}(z) = \frac{1}{2} i \cosh^{-1}\left(\frac{z^2-2}{z^2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1167.01

$$\csc^{-1}(z) = -\frac{1}{2} \sqrt{-\frac{1}{z^2}} z \cosh^{-1}\left(\frac{z^2-2}{z^2}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{2-z^2}{z^2}\right)$

01.17.27.1168.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{1}{2} i \cosh^{-1}\left(\frac{2-z^2}{z^2}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1169.01

$$\csc^{-1}(z) = \frac{1}{2} i \cosh^{-1}\left(\frac{2-z^2}{z^2}\right) + \frac{\pi}{2}; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1170.01

$$\csc^{-1}(z) = -\frac{1}{2} i \cosh^{-1}\left(\frac{2-z^2}{z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1171.01

$$\csc^{-1}(z) = \frac{1}{2} i \cosh^{-1}\left(\frac{2-z^2}{z^2}\right) - \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1172.01

$$\csc^{-1}(z) = \frac{1}{2} z \sqrt{\frac{1}{z^2}} \pi - \frac{1}{2} \sqrt{-\frac{1}{z^2}} z \sqrt{1-z^2} \sqrt{\frac{1}{1-z^2}} \cosh^{-1}\left(\frac{2-z^2}{z^2}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right)$

01.17.27.1173.01

$$\csc^{-1}(z) = -2 i \cosh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right) - \frac{\pi}{2}; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1174.01

$$\csc^{-1}(z) = 2 i \cosh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1175.01

$$\csc^{-1}(z) = -2 \sqrt{\frac{z-1}{z^2}} z \sqrt{\frac{1}{z+1}} \sqrt{\frac{z+1}{1-z}} \cosh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right)$

01.17.27.1176.01

$$\csc^{-1}(z) = -2i \cosh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right) - \frac{\pi}{2}; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1177.01

$$\csc^{-1}(z) = 2i \cosh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1178.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \cosh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1179.01

$$\csc^{-1}(z) = \left(\frac{1}{2} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right)\pi - 2\sqrt{\frac{z-1}{z^2}} z \sqrt{\frac{1}{z+1}} \sqrt{\frac{z+1}{1-z}} \cosh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-2z}}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{z-1}{2z}}\right)$

01.17.27.1180.01

$$\csc^{-1}(z) = -2i \cosh^{-1}\left(\sqrt{\frac{z-1}{2z}}\right) - \frac{\pi}{2}; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1181.01

$$\csc^{-1}(z) = 2i \cosh^{-1}\left(\sqrt{\frac{z-1}{2z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1182.01

$$\csc^{-1}(z) = -2\sqrt{\frac{z-1}{z^2}} z \sqrt{\frac{1}{z+1}} \sqrt{\frac{z+1}{1-z}} \cosh^{-1}\left(\sqrt{\frac{z-1}{2z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right)$

01.17.27.1183.01

$$\csc^{-1}(z) = -2i \cosh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1184.01

$$\csc^{-1}(z) = 2i \cosh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1185.01

$$\csc^{-1}(z) = 2i \cosh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{2z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1186.01

$$\csc^{-1}(z) = \left(\sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{1}{2} \right) \pi - 2 \sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \cosh^{-1} \left(\frac{\sqrt{z+1}}{\sqrt{2z}} \right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1} \left(\frac{\sqrt{-z-1}}{\sqrt{-2z}} \right)$

01.17.27.1187.01

$$\csc^{-1}(z) = -2i \cosh^{-1} \left(\frac{\sqrt{-z-1}}{\sqrt{-2z}} \right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1188.01

$$\csc^{-1}(z) = 2i \cosh^{-1} \left(\frac{\sqrt{-z-1}}{\sqrt{-2z}} \right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1189.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \cosh^{-1} \left(\frac{\sqrt{-z-1}}{\sqrt{-2z}} \right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1} \left(\sqrt{\frac{z+1}{2z}} \right)$

01.17.27.1190.01

$$\csc^{-1}(z) = -2i \cosh^{-1} \left(\sqrt{\frac{z+1}{2z}} \right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1191.01

$$\csc^{-1}(z) = 2i \cosh^{-1} \left(\sqrt{\frac{z+1}{2z}} \right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1192.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 \sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \cosh^{-1} \left(\sqrt{\frac{z+1}{2z}} \right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1} \left(\frac{1}{\sqrt{z^2}} \right)$

01.17.27.1193.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \cosh^{-1} \left(\frac{1}{\sqrt{z^2}} \right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1194.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1195.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1196.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1197.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{z} \sqrt{\frac{z+1}{z-1}} \sqrt{\frac{z-1}{z+1}} \cosh^{-1}\left(\frac{1}{\sqrt{z^2}}\right) + \frac{\pi \sqrt{z^2}}{2z}$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right)$

01.17.27.1198.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1199.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1200.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1201.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1202.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{z} \sqrt{\frac{z+1}{z-1}} \sqrt{\frac{z-1}{z+1}} \cosh^{-1}\left(\sqrt{\frac{1}{z^2}}\right) + \frac{\pi z}{2} \sqrt{\frac{1}{z^2}}$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

01.17.27.1203.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1204.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1205.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) - \pi; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1206.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) - \pi; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1207.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) + \pi; (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1208.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{i}{z}} \sqrt{-iz} + \frac{\sqrt{z^2}}{z} \right) - z \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

01.17.27.1209.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); 0 \leq \arg(z) < \pi$$

01.17.27.1210.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1211.01

$$\csc^{-1}(z) = -z \sqrt{-\frac{1}{z^2}} \cosh^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

01.17.27.1212.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1213.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1214.01

$$\csc^{-1}(z) = \pi - i \cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1215.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) - \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1216.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \right) - z \sqrt{-\frac{1}{z^2}} \cosh^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

01.17.27.1217.01

$$\csc^{-1}(z) = -i \cosh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); 0 \leq \arg(z) < \pi$$

01.17.27.1218.01

$$\csc^{-1}(z) = i \cosh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1219.01

$$\csc^{-1}(z) = -z \sqrt{-\frac{1}{z^2}} \cosh^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1}\left(\frac{2}{z} \sqrt{1 - \frac{1}{z^2}}\right)$

01.17.27.1220.01

$$\csc^{-1}(z) = \frac{\pi}{4} - \frac{1}{2} \left(z \sqrt{-\frac{1}{z^2}} \right) \cosh^{-1} \left(\frac{2}{z} \sqrt{1 - \frac{1}{z^2}} \right) ; \operatorname{Re}(z) > 0 \wedge \operatorname{Im}(z) \neq 0 \vee \operatorname{Re}(z) < -\sqrt{2}$$

01.17.27.1221.01

$$\csc^{-1}(z) =$$

$$\frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{z}{\sqrt{\frac{1}{z^2} - 1}} \sqrt{\frac{1}{z^4} - \frac{1}{z^2}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z + \sqrt{2}}} \sqrt{\frac{z + \sqrt{2}}{z}} \sqrt{z} + \sqrt{1 - \frac{\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z - \sqrt{2}}} \right) - \frac{2 \sqrt{\frac{1}{z^2} - 1} \sqrt{\frac{2}{z^2} - 1} \sqrt{-\frac{1}{z^2}} \left(\frac{z}{z - 2 \sqrt{1 - \frac{1}{z^2}}} \sqrt{-\frac{1}{z^2} \left(z - 2 \sqrt{1 - \frac{1}{z^2}} \right)^2} \cosh^{-1} \left(\frac{2}{z} \sqrt{1 - \frac{1}{z^2}} \right) + \frac{\pi}{2} \right) \right)$$

Involving $\csc^{-1}(z)$ and $\cosh^{-1} \left(\frac{2 \sqrt{z^2 - 1}}{z^2} \right)$

01.17.27.1222.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{2z} \cosh^{-1} \left(\frac{2 \sqrt{z^2 - 1}}{z^2} \right) + \frac{\pi \sqrt{z^2}}{4z} ; z \notin (-1, 1)$$

01.17.27.1223.01

$$\csc^{-1}(z) = \frac{\pi}{4} \sqrt{\frac{z^2 - 2}{z^2}} \sqrt{\frac{z^2}{z^2 - 2}} \left(\sqrt{\frac{z^2}{z}} - \sqrt{\frac{z}{z + \sqrt{2}}} \sqrt{\frac{z + \sqrt{2}}{z}} + \sqrt{\frac{z - \sqrt{2}}{z}} \sqrt{\frac{z}{z - \sqrt{2}}} \right) - \frac{z \sqrt{z^2 - 2}}{2 \sqrt{z^2} (2 - z^2)} \cosh^{-1} \left(\frac{2 \sqrt{z^2 - 1}}{z^2} \right)$$

01.17.27.1224.01

$$\begin{aligned} \csc^{-1}(z) = & \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{\sqrt{\frac{1-z^2}{z^4}} z}{\sqrt{\frac{1-z^2}{z^2}}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) \right. \\ & \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-1}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \\ & \left. \left(\frac{\pi}{2} - \frac{1}{\sqrt{\frac{2\sqrt{z^2-1}}{z^2} - 1}} \sqrt{1 - \frac{2\sqrt{z^2-1}}{z^2}} \cosh^{-1} \left(\frac{2\sqrt{z^2-1}}{z^2} \right) \right) \right) \end{aligned}$$

Involving $\csc^{-1}(\sqrt{cz})$

Involving $\csc^{-1}(\sqrt{z})$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1225.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1226.01

$$\csc^{-1}(\sqrt{z}) = i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1227.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}(\sqrt{z})$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1228.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1229.01

$$\csc^{-1}(\sqrt{z}) = i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1230.01

$$\csc^{-1}(\sqrt{z}) = -i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1231.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} \sqrt{z} \sqrt{\frac{1}{z}} - \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\cosh^{-1}\left(\sqrt{1 + \frac{1}{z}}\right)$

01.17.27.1232.01

$$\csc^{-1}(\sqrt{-z}) = i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z}}\right); \text{Im}(z) > 0$$

01.17.27.1233.01

$$\csc^{-1}(\sqrt{-z}) = -i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z}}\right); \text{Im}(z) \leq 0$$

01.17.27.1234.01

$$\csc^{-1}(\sqrt{-z}) = -\sqrt{-z} \sqrt{\frac{1}{z}} \cosh^{-1}\left(\sqrt{1 + \frac{1}{z}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\cosh^{-1}\left(1 + \frac{2}{z}\right)$

01.17.27.1235.01

$$\csc^{-1}(\sqrt{-z}) = -\frac{i}{2} \cosh^{-1}\left(1 + \frac{2}{z}\right); \text{Im}(z) \leq 0$$

01.17.27.1236.01

$$\csc^{-1}(\sqrt{-z}) = \frac{1}{2} i \cosh^{-1}\left(1 + \frac{2}{z}\right); 0 < \arg(z) < \pi$$

01.17.27.1237.01

$$\csc^{-1}(\sqrt{-z}) = -\frac{\sqrt{-z}}{2} \sqrt{\frac{1}{z}} \cosh^{-1}\left(1 + \frac{2}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}(\sqrt{z})$

01.17.27.1238.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - i \cosh^{-1}(\sqrt{z}); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1239.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} + i \cosh^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1240.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\cosh^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.17.27.1241.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - i \cosh^{-1}\left(1/\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1242.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} + i \cosh^{-1}\left(1/\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1243.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \cosh^{-1}\left(1/\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1244.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} \sqrt{\frac{1}{z}} \sqrt{z} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cosh^{-1}(\sqrt{1+z})$

01.17.27.1245.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \cosh^{-1}(\sqrt{z+1}) /; -\pi < \arg(z) \leq 0$$

01.17.27.1246.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \cosh^{-1}(\sqrt{z+1}) /; 0 < \arg(z) \leq \pi$$

01.17.27.1247.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z}}{\sqrt{z}} \cosh^{-1}(\sqrt{z+1})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\cosh^{-1}(1+2z)$

01.17.27.1248.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{1}{2} i \cosh^{-1}(2z+1) /; -\pi < \arg(z) \leq 0$$

01.17.27.1249.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{1}{2} i \cosh^{-1}(2z+1) ; 0 < \arg(z) \leq \pi$$

01.17.27.1250.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2}}{2z} \cosh^{-1}(2z+1)$$

Involving $\csc^{-1}(\sqrt{z^2})$

Involving $\csc^{-1}(\sqrt{z^2})$ and $\cosh^{-1}(\frac{1}{z})$

01.17.27.1251.01

$$\csc^{-1}(\sqrt{z^2}) = \frac{\pi}{2} - i \cosh^{-1}\left(\frac{1}{z}\right) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1252.01

$$\csc^{-1}(\sqrt{z^2}) = i \cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1253.01

$$\csc^{-1}(\sqrt{z^2}) = i \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} ; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1254.01

$$\csc^{-1}(\sqrt{z^2}) = -i \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} ; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1255.01

$$\csc^{-1}(\sqrt{z^2}) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \frac{1}{\sqrt{\frac{1}{z} - 1}} \sqrt{1 - \frac{1}{z}} \cosh^{-1}\left(\frac{1}{z}\right) \right)$$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$ and $\cosh^{-1}(z)$

01.17.27.1256.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = -\frac{\pi}{2} - 2i \cosh^{-1}(z) ; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1257.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2i \cosh^{-1}(z) - \frac{\pi}{2} ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1258.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2i \cosh^{-1}(z) + \frac{3\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1259.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{3\pi}{2} - 2i \cosh^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1260.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \pi \left(\frac{1}{2} - \frac{\sqrt{z^2}}{z} \right) + \frac{2\sqrt{1-z}\sqrt{z^2}}{z\sqrt{z-1}} \cosh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z^2-1}\right)$ and $\cosh^{-1}(z)$

01.17.27.1261.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = \frac{\pi}{2} + 2i \cosh^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1262.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -2i \cosh^{-1}(z) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1263.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -2i \cosh^{-1}(z) - \frac{3\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1264.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -\frac{3\pi}{2} + 2i \cosh^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1265.01

$$\csc^{-1}\left(\frac{1}{2z^2-1}\right) = -\pi \left(\frac{1}{2} - \frac{\sqrt{z^2}}{z} \right) - \frac{2\sqrt{z^2}\sqrt{1-z}}{z\sqrt{z-1}} \cosh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1266.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = 2i \cosh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1267.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{z^2-2}\right) = -2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \quad \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1268.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{3\pi}{2} - 2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.1269.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{z^2-2}\right) = 2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1270.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{z^2-2}\right) = \pi \left(\frac{1}{2} - \sqrt{\frac{1}{z^2} z} \right) + \frac{2z}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \sqrt{\frac{1}{z^2}} \operatorname{cosh}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right)$ and $\operatorname{cosh}^{-1}\left(\frac{1}{z}\right)$

01.17.27.1271.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right) = -2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \quad \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1272.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right) = 2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \quad \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1273.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right) = -\frac{3\pi}{2} + 2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.1274.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right) = -2i \operatorname{cosh}^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1275.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2-z^2}\right) = -\pi \left(\frac{1}{2} - \sqrt{\frac{1}{z^2} z} \right) - \frac{2z}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \sqrt{\frac{1}{z^2}} \operatorname{cosh}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\cosh^{-1}(\sqrt{z})$

01.17.27.1276.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \cosh^{-1}(\sqrt{z}) ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1277.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \cosh^{-1}(\sqrt{z}) ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1278.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\cosh^{-1}(\sqrt{z+1})$

01.17.27.0035.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \cosh^{-1}(\sqrt{z+1})$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\cosh^{-1}(\sqrt{z})$

01.17.27.1279.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \cosh^{-1}(\sqrt{z}) ; \operatorname{Im}(z) \geq 0$$

01.17.27.1280.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \cosh^{-1}(\sqrt{z}) ; \operatorname{Im}(z) < 0$$

01.17.27.1281.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\sqrt{-1+z} \sqrt{\frac{1}{1-z}} \cosh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\cosh^{-1}(\sqrt{z+1})$

01.17.27.1282.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \cosh^{-1}(\sqrt{z+1}) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+z}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1283.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2} (\pi - i \cosh^{-1}(z)) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1284.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2} (\pi + i \cosh^{-1}(z)) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1285.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2} \left(\pi - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1286.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{i}{2} \cosh^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1287.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = -\frac{i}{2} \cosh^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1288.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = -\frac{\sqrt{z} \sqrt{1-z}}{2} \sqrt{\frac{1}{1-z}} \sqrt{-\frac{1}{z}} \cosh^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1289.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2}(\pi - i \cosh^{-1}(z)) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1290.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2}(i \cosh^{-1}(z) + \pi) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1291.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = -\frac{1}{2}(i \cosh^{-1}(z) + \pi) /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1292.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2}\sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\pi - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1293.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{i}{2} \cosh^{-1}(z) /; \operatorname{Im}(z) \geq 0$$

01.17.27.1294.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{i}{2} \cosh^{-1}(z) /; \operatorname{Im}(z) < 0$$

01.17.27.1295.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{1}{2}\sqrt{z} \sqrt{-\frac{1}{z}} \cosh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1296.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1297.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1298.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); |\arg(z)| < \pi$$

01.17.27.1299.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right) + \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1300.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1301.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1302.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); |\arg(z)| < \pi$$

01.17.27.1303.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right)$ and $\cosh^{-1}\left(1 + \frac{2}{z}\right)$

01.17.27.1304.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{2 \sqrt{-z-1} \sqrt{z}} \left(\pi - z \sqrt{-\frac{1}{z^2}} \cosh^{-1}\left(1 + \frac{2}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{z+1}{z}}\right)$

01.17.27.1305.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \left(\frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \cosh^{-1}\left(\sqrt{\frac{z+1}{z}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1306.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0$$

01.17.27.1307.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1308.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right) - \sqrt{\frac{1}{z}} \sqrt{-z} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1309.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.17.27.1310.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.1311.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -\sqrt{\frac{1}{z}} \sqrt{-z} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1312.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0$$

01.17.27.1313.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1314.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \pi - i \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1315.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right); z \notin (-\infty, 1)$$

01.17.27.1316.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) - \sqrt{\frac{z}{z-1}} \sqrt{\frac{1-z}{z}} \cosh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1317.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \text{Im}(z) > 0$$

01.17.27.1318.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right); \text{Im}(z) \leq 0$$

01.17.27.1319.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -\sqrt{-z} \sqrt{\frac{1}{z}} \cosh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1320.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{1}{2} i \cosh^{-1}\left(\frac{1}{z}\right); \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1321.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = -\frac{i}{2} \cosh^{-1}\left(\frac{1}{z}\right); \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1322.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{1}{2 \sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1323.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(\pi - i \cosh^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1324.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(i \cosh^{-1}\left(\frac{1}{z}\right) + \pi\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1325.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(\pi - \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\frac{1}{z}\right)\right); |\arg(z)| < \pi$$

01.17.27.1326.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{\pi(\sqrt{-z-1}\sqrt{z})}{2(\sqrt{-z}\sqrt{z+1})} - \frac{\sqrt{-z-1}\sqrt{z-1}}{2\sqrt{\frac{1-z}{z}}\sqrt{-z(z+1)}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{a-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1327.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2}\left(\pi - i \cosh^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1328.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2}\left(\pi + i \cosh^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1329.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2}\left(\pi - \frac{1}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \cosh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1330.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2}i \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.1331.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2}i \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0$$

01.17.27.1332.01

$$\csc^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z}}\sqrt{-z}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+a}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1333.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}\left(\pi - i\cosh^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1334.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}\left(i\cosh^{-1}\left(\frac{1}{z}\right) + \pi\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1335.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = -\frac{1}{2}\left(i\cosh^{-1}\left(\frac{1}{z}\right) + \pi\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1336.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}\left(\pi - \frac{\sqrt{z-1}}{\sqrt{1-z}}\cosh^{-1}\left(\frac{1}{z}\right)\right); |\arg(z)| < \pi$$

01.17.27.1337.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{\pi(\sqrt{-z-1}\sqrt{z})}{2(\sqrt{-z}\sqrt{z+1})} - \frac{\sqrt{-z-1}\sqrt{z-1}}{2\sqrt{\frac{1-z}{z}}\sqrt{-z(z+1)}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1338.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2}i\cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0$$

01.17.27.1339.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2}i\cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.1340.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z}}\sqrt{-z}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+cz^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1341.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i\cosh^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1342.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i\cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1343.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi + i\cosh^{-1}(z) /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1344.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi - i\cosh^{-1}(z) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1345.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}}\cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1346.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi}{2}\left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{\sqrt{1-z}\sqrt{z^2}}{\sqrt{z-1}z}\cosh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$ and $\cosh^{-1}(1+2z^2)$

01.17.27.1347.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{1}{2}i\cosh^{-1}(2z^2+1) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1348.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{1}{2} i \cosh^{-1}(2z^2+1) + \frac{\pi}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1349.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^4}}{2z^2} \cosh^{-1}(2z^2+1)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$ and $\cosh^{-1}\left(\sqrt{z^2+1}\right)$

01.17.27.1350.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{z^2+1}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1351.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = i \cosh^{-1}\left(\sqrt{z^2+1}\right) + \frac{\pi}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1352.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^4}}{z^2} \cosh^{-1}\left(\sqrt{z^2+1}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+cz^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1353.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \cosh^{-1}(z) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1354.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \cosh^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1355.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi + i \cosh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1356.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi - i \cosh^{-1}(z) ; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1357.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\pi - i \cosh^{-1}(z) ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1358.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right) \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} - \sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \cosh^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)$ and $\cosh^{-1}(1+2z^2)$

01.17.27.1359.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{\pi}{2} - \frac{1}{2} i \cosh^{-1}(2z^2+1) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1360.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{1}{2} i \cosh^{-1}(2z^2+1) + \frac{\pi}{2} ; 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.1361.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = -\frac{1}{2} i \cosh^{-1}(2z^2+1) - \frac{\pi}{2} ; (i z \in \mathbb{R} \wedge i z < -1) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.1362.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\pi}{2} - \frac{\sqrt{-z^4}}{2z^2} \cosh^{-1}(2z^2+1)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)$ and $\cosh^{-1}(\sqrt{z^2+1})$

01.17.27.1363.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{\pi}{2} - i \cosh^{-1}(\sqrt{z^2+1}) ; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1364.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = i \cosh^{-1}(\sqrt{z^2+1}) + \frac{\pi}{2} ; 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.1365.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = -i \cosh^{-1}\left(\sqrt{z^2+1}\right) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge i z < -1) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.1366.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\pi}{2} - \frac{\sqrt{-z^4}}{z^2} \cosh^{-1}\left(\sqrt{z^2+1}\right)\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+a}}\right)$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1367.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1368.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1369.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right) - \pi; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1370.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right) - \pi; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1371.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \pi - i \cosh^{-1}\left(\frac{1}{z}\right); (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.1372.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{\sqrt{z-1}}{\sqrt{1-z}} \cosh^{-1}\left(\frac{1}{z}\right); \operatorname{Re}(z) \neq 0 \wedge |\arg(z)| < \pi$$

01.17.27.1373.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - \sqrt{z^2} \sqrt{\frac{1}{z^2}}\right) + \frac{\sqrt{z^2}}{\sqrt{\frac{1-z}{z}}} \sqrt{\frac{z-1}{z}} \sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\cosh^{-1}\left(1+2z^{-2}\right)$

01.17.27.1374.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(\pi - i \cosh^{-1}\left(1 + \frac{2}{z^2}\right)\right); 0 \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.1375.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(i \cosh^{-1}\left(1 + \frac{2}{z^2}\right) + \pi\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.1376.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -\frac{1}{2}\left(i \cosh^{-1}\left(1 + \frac{2}{z^2}\right) + \pi\right); \frac{\pi}{2} < \arg(z) < \pi \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.1377.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(i \cosh^{-1}\left(1 + \frac{2}{z^2}\right) - \pi\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1378.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2+1}}{2z\sqrt{-\frac{z^2+1}{z^4}}}\left(\sqrt{\frac{1}{z^2}} \cosh^{-1}\left(1 + \frac{2}{z^2}\right) + \pi \sqrt{-\frac{1}{z^2}}\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right)$

01.17.27.1379.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right); 0 \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.1380.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.1381.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.1382.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1383.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2+1}}{2z\sqrt{-\frac{z^2+1}{z^4}}}\left(2\sqrt{\frac{1}{z^2}}\cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right) + \pi\sqrt{-\frac{1}{z^2}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1384.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1385.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1386.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right) + \pi /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.1387.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right) + \pi /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1388.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z^2}}z\right) - \frac{z\sqrt{z}}{\sqrt{-1+z}}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1-z}{z}}\cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$ and $\cosh^{-1}\left(\frac{z^2+2}{z^2}\right)$

01.17.27.1389.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) = \frac{\sqrt{-z^2(z^2+1)}}{\sqrt{z^2}\sqrt{-z^2-1}} \left(\frac{\pi}{2} - \frac{1}{2} z^2 \sqrt{-\frac{1}{z^4}} \cosh^{-1}\left(\frac{z^2+2}{z^2}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{a-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1390.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2}$$

01.17.27.1391.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.17.27.1392.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \pi - i \cosh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.1393.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right) + \pi; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1394.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right) - \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1395.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \left(\frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z^2}} z \right) + \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{\frac{1-z}{z}}} \sqrt{\frac{1}{z^2}} \cosh^{-1}\left(\frac{1}{z}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\cosh^{-1}\left(\frac{z^2+2}{z^2}\right)$

01.17.27.1396.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \frac{1}{2}i \cosh^{-1}\left(\frac{z^2+2}{z^2}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1397.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{1}{2}i \cosh^{-1}\left(\frac{z^2+2}{z^2}\right) + \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\frac{\pi}{2} \leq \arg(z) < 0$$

01.17.27.1398.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \frac{1}{2}z^2 \sqrt{-\frac{1}{z^4}} \cosh^{-1}\left(\frac{z^2+2}{z^2}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right)$

01.17.27.1399.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1400.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} + i \cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right); \frac{\pi}{2} \leq \arg(z) < \pi \vee -\frac{\pi}{2} \leq \arg(z) < 0$$

01.17.27.1401.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - z^2 \sqrt{-\frac{1}{z^4}} \cosh^{-1}\left(\sqrt{1+\frac{1}{z^2}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+c}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1402.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2}$$

01.17.27.1403.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.17.27.1404.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \pi - i \cosh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.1405.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \cosh^{-1}\left(\frac{1}{z}\right) + \pi; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1406.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \cosh^{-1}\left(\frac{1}{z}\right) - \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1407.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi}{2} \sqrt{\frac{z^2}{z^2-1}} \sqrt{\frac{z^2-1}{z^2}} \left(1 - \sqrt{\frac{1}{z^2}} z\right) + \frac{(-z)^{3/2} z}{\sqrt{z-1} \sqrt{z+1}} \sqrt{\frac{1}{z}} \sqrt{\frac{z^2-1}{z^4}} \cosh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\cosh^{-1}(1 + 2z^{-2})$

01.17.27.1408.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{1}{2} \left(\pi - i \cosh^{-1}\left(1 + \frac{2}{z^2}\right)\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1409.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{1}{2} \left(i \cosh^{-1}\left(1 + \frac{2}{z^2}\right) + \pi\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.1410.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\frac{1}{2} \left(i \cosh^{-1}\left(1 + \frac{2}{z^2}\right) + \pi\right); (iz \in \mathbb{R} \wedge -1 < iz < 1)$$

01.17.27.1411.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \sqrt{\frac{z^2+1}{z^2}} \sqrt{\frac{z^2}{z^2+1}} \left(\frac{\pi}{2} - \frac{1}{2} \left(z^2 \sqrt{-\frac{1}{z^4}}\right) \cosh^{-1}\left(1 + \frac{2}{z^2}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\cosh^{-1}\left(\sqrt{z^{-2}+1}\right)$

01.17.27.1412.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{\pi}{2} - i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1413.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right) + \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.1414.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -i \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.1415.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \sqrt{\frac{z^2+1}{z^2}} \sqrt{\frac{z^2}{z^2+1}} \left(\frac{\pi}{2} - z^2 \sqrt{-\frac{1}{z^4}} \cosh^{-1}\left(\sqrt{1 + \frac{1}{z^2}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1416.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi + 2i \cosh^{-1}(z); \frac{\pi}{4} \leq \arg(z) \leq \frac{3\pi}{4}$$

01.17.27.1417.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2i \cosh^{-1}(z); -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{4}$$

01.17.27.1418.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2 \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z); \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.27.1419.01

$$\begin{aligned} \operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) &= \frac{\pi\sqrt{1-2z^2}\sqrt{z^4-z^2}}{2\sqrt{-z^2}\sqrt{z^2-1}\sqrt{2z^2-1}} \\ &\left(\frac{\sqrt{z^2}}{z}-\sqrt{\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{\sqrt{2}z+1}}\sqrt{\sqrt{2}z+1}+\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{1}{1-\sqrt{2}z}}\sqrt{1-\sqrt{2}z}+\frac{\sqrt{z^4-z^2}}{z\sqrt{z^2-1}}-2\right)+ \\ &\frac{2\sqrt{1-z}\sqrt{1-2z^2}\sqrt{z^4-z^2}}{\sqrt{z-1}\sqrt{-z^2}\sqrt{z^2-1}\sqrt{2z^2-1}}\operatorname{cosh}^{-1}(z) \end{aligned}$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right)$ and $\operatorname{cosh}^{-1}\left(\frac{1}{z}\right)$

01.17.27.1420.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right) = \frac{\sqrt{z^2}\pi}{z} - \frac{2\sqrt{z^2}\sqrt{z-1}}{z\sqrt{1-z}}\operatorname{cosh}^{-1}\left(\frac{1}{z}\right); |z| \geq \sqrt{2} \wedge \operatorname{Im}(z) \neq 0$$

01.17.27.1421.01

$$\begin{aligned} \operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right) &= -\frac{z^3\sqrt{z^2-2}\sqrt{z^2-1}}{2\sqrt{1-z}(z+1)\sqrt{-z^4+3z^2-2}}\sqrt{\frac{1-z^2}{z^4}}\sqrt{\frac{1}{z}} \\ &\sqrt{\frac{z+1}{z}}\left(\pi\left(\frac{z^3}{1-z^2}\sqrt{\frac{1-z^2}{z^2}}\sqrt{\frac{1-z^2}{z^4}}+\sqrt{\frac{1}{z^2}}z-\sqrt{\frac{1}{z}}\sqrt{\frac{z}{z+\sqrt{2}}}\sqrt{\frac{z+\sqrt{2}}{z}}\sqrt{z}+\right. \right. \\ &\left.\left.\sqrt{1-\frac{\sqrt{2}}{z}}\sqrt{-\frac{1}{z}}\sqrt{-z}\sqrt{\frac{z}{z-\sqrt{2}}}-2\right)+\frac{4}{\sqrt{\frac{1}{z}-1}}\sqrt{1-\frac{1}{z}}\operatorname{cosh}^{-1}\left(\frac{1}{z}\right)\right) \end{aligned}$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1+cz^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right)$ and $\cosh^{-1}(iz)$

01.17.27.1422.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2}i \cosh^{-1}(iz) - \frac{\pi}{4}; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1423.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}i \cosh^{-1}(iz) + \frac{\pi}{4}; -\frac{\pi}{2} < \arg(z) \leq 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.1424.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}i \cosh^{-1}(iz) - \frac{\pi}{4}; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1425.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\pi}{4} - \frac{1}{2}i \cosh^{-1}(iz); -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.1426.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\sqrt{1-iz}}{2\sqrt{iz-1}} \cosh^{-1}(iz) - \frac{\pi}{4}; 0 < \arg(z) \leq \pi$$

01.17.27.1427.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\pi}{4} - \frac{\sqrt{1-iz}}{2\sqrt{iz-1}} \cosh^{-1}(iz); -\pi < \arg(z) \leq 0$$

01.17.27.1428.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{i\sqrt{-z^2}}{z} \left(\frac{\sqrt{1-iz} \cosh^{-1}(iz)}{2\sqrt{iz-1}} - \frac{\pi}{4} \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right)$ and $\cosh^{-1}(z)$

01.17.27.1429.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \cosh^{-1}(z) + \frac{\pi}{2}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1430.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \cosh^{-1}(z)\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1431.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\left(i \cosh^{-1}(z) + \frac{\pi}{2}\right); \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1432.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \cosh^{-1}(z) - \frac{\pi}{2}\right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1433.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1434.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z) - \frac{\pi}{2}\right); \operatorname{Re}(z) < 0 \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.1435.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z} \left(\frac{\pi}{2} - \frac{\sqrt{1-z} \cosh^{-1}(z)}{\sqrt{z-1}}\right)$$

Involving $\csc^{-1}\left(\sqrt{2/\left(1-\sqrt{1-z^2}\right)}\right)$

Involving $\csc^{-1}\left(\sqrt{2/\left(1-\sqrt{1-z^2}\right)}\right)$ and $\cosh^{-1}(z)$

01.17.27.1436.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \cosh^{-1}(z) + \frac{\pi}{2}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1437.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \cosh^{-1}(z)\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1438.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\left(i \cosh^{-1}(z) + \frac{\pi}{2}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.17.27.1439.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \cosh^{-1}(z) - \frac{\pi}{2}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.1440.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}z \sqrt{\frac{1}{z^2} \left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \cosh^{-1}(z)\right)}$$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$ and $\cosh^{-1}(z)$

01.17.27.1441.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \cosh^{-1}(z) + \frac{\pi}{2}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.17.27.1442.01} \quad \csc^{-1} \left(\frac{\sqrt{2z^2}}{z \sqrt{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(\frac{\pi}{2} - i \cosh^{-1}(z) \right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.17.27.1443.01} \quad \csc^{-1} \left(\frac{\sqrt{2z^2}}{z \sqrt{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(\frac{\pi}{2} - \frac{\sqrt{1-z} \cosh^{-1}(z)}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1} \left(\frac{1}{z} \sqrt{2z^2 / (1 - \sqrt{1 - z^2})} \right)$

Involving $\csc^{-1} \left(\frac{1}{z} \sqrt{2z^2 / (1 - \sqrt{1 - z^2})} \right)$ and $\cosh^{-1}(z)$

$$\text{01.17.27.1444.01} \quad \csc^{-1} \left(\frac{1}{z} \sqrt{\frac{2z^2}{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(i \cosh^{-1}(z) + \frac{\pi}{2} \right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

$$\text{01.17.27.1445.01} \quad \csc^{-1} \left(\frac{1}{z} \sqrt{\frac{2z^2}{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(\frac{\pi}{2} - i \cosh^{-1}(z) \right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

$$\text{01.17.27.1446.01} \quad \csc^{-1} \left(\frac{1}{z} \sqrt{\frac{2z^2}{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(\frac{\pi}{2} - \frac{\sqrt{1-z} \cosh^{-1}(z)}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1} \left(\sqrt{2z} / \sqrt{z - \sqrt{z^2 - 1}} \right)$

Involving $\csc^{-1} \left(\sqrt{2z} / \sqrt{z - \sqrt{z^2 - 1}} \right)$ and $\cosh^{-1}(\frac{1}{z})$

01.17.27.1447.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = \frac{1}{2} \left(\frac{\pi}{2} - i \cosh^{-1} \left(\frac{1}{z} \right) \right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.1448.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = \frac{1}{2} \left(i \cosh^{-1} \left(\frac{1}{z} \right) + \frac{\pi}{2} \right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1449.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = \frac{1}{2} \left(\frac{3\pi}{2} - i \cosh^{-1} \left(\frac{1}{z} \right) \right); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1450.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = \frac{1}{2} \left(i \cosh^{-1} \left(\frac{1}{z} \right) + \frac{3\pi}{2} \right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1451.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = -\frac{1}{2} \left(i \cosh^{-1} \left(\frac{1}{z} \right) + \frac{3\pi}{2} \right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1452.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{z - \sqrt{z^2 - 1}}} \right) = \frac{\sqrt{z-1} \sqrt{-iz} \sqrt{z}}{2\sqrt{\frac{1}{z}-1}} \sqrt{\frac{i}{z}} \sqrt{-\frac{1}{z+1}} \sqrt{-\frac{z+1}{z^2}} \cosh^{-1} \left(\frac{1}{z} \right) - \frac{1}{4} \pi \sqrt{-\frac{1}{z+1}} \sqrt{-\frac{z+1}{z^2}} \left(\sqrt{\frac{i}{z}} \sqrt{-iz} z + z - \sqrt{z^2} \right)$$

Involving $\operatorname{csc}^{-1} \left(\sqrt{2z / (z - \sqrt{z^2 - 1})} \right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right)$ and $\cosh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1453.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \cosh^{-1}\left(\frac{1}{z}\right)\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.1454.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \cosh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1455.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - i \cosh^{-1}\left(\frac{1}{z}\right)\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1456.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \cosh^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1457.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{\sqrt{-iz} z \sqrt{z-1} \sqrt{z+1}}{2\sqrt{1-z}} \sqrt{\frac{i}{z}} \sqrt{-\frac{1}{(z+1)^2}} \sqrt{-\frac{z+1}{z^2}} \cosh^{-1}\left(\frac{1}{z}\right) - \frac{1}{4}\pi \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{-\frac{1}{(z+1)^2}} \sqrt{z+1} \sqrt{-\frac{z+1}{z^2}} \left(\sqrt{\frac{i}{z}} \sqrt{-iz} z + z - \sqrt{z^2}\right)$$

Involving \tanh^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{1-z^2}\right)$

01.17.27.1458.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \tanh^{-1}\left(\sqrt{1-z^2}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1459.01

$$\csc^{-1}(z) = i \tanh^{-1}\left(\sqrt{1-z^2}\right) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1460.01

$$\csc^{-1}(z) = -i \tanh^{-1}\left(\sqrt{1-z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1461.01

$$\csc^{-1}(z) = i \tanh^{-1}\left(\sqrt{1-z^2}\right) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1462.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \tanh^{-1}\left(\sqrt{1-z^2}\right) + \frac{\pi}{2} \right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

01.17.27.1463.01

$$\csc^{-1}(z) = -i \tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1464.01

$$\csc^{-1}(z) = i \tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1465.01

$$\csc^{-1}(z) = \pi - i \tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1466.01

$$\csc^{-1}(z) = i \tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1467.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(-\sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} + \sqrt{\frac{z}{1+z}} \sqrt{\frac{1+z}{z}} \right) + \frac{\sqrt{z^2-z^4}}{z\sqrt{z^2-1}} \tanh^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

01.17.27.1468.01

$$\csc^{-1}(z) = -i \tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1469.01

$$\csc^{-1}(z) = i \tanh^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1470.01

$$\csc^{-1}(z) = \pi - i \tanh^{-1} \left(\sqrt{\frac{1}{1-z^2}} \right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1471.01

$$\csc^{-1}(z) = i \tanh^{-1} \left(\sqrt{\frac{1}{1-z^2}} \right) - \pi ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1472.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}} \right) - \frac{\sqrt{z^2-1}}{z} \sqrt{\frac{z^2}{1-z^2}} \tanh^{-1} \left(\sqrt{\frac{1}{1-z^2}} \right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1} \left(\frac{2\sqrt{1-z^2}}{-2+z^2} \right)$

01.17.27.1473.01

$$\csc^{-1}(z) = \frac{z\sqrt{z^2}}{2\sqrt{-z^4}} \tanh^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right) ; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.1474.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \sqrt{\frac{z}{\sqrt{2}-z}} \sqrt{\frac{1}{z}} \sqrt{\frac{\sqrt{2}-z}{z}} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\frac{z}{z+\sqrt{2}}} \sqrt{-\frac{z+\sqrt{2}}{z}} + \frac{\sqrt{\frac{1-z^2}{z^2}}}{\sqrt{\frac{1-z^2}{z^4} z}} \right) - \frac{2\sqrt{z^2} \sqrt{1-z^2}}{z\sqrt{z^2-1}} \tanh^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right) \right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right)$

01.17.27.1475.01

$$\csc^{-1}(z) = \frac{\pi}{4} + \frac{1}{2} i \tanh^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right) ; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1476.01

$$\csc^{-1}(z) = \frac{\pi}{4} - \frac{1}{2} i \tanh^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right) ; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1477.01

$$\csc^{-1}(z) = -\frac{\pi}{4} + \frac{1}{2} i \tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right); \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1478.01

$$\csc^{-1}(z) = -\frac{\pi}{4} - \frac{1}{2} i \tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1479.01

$$\csc^{-1}(z) = -\frac{1}{2} i \tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) - \frac{3\pi}{4}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1480.01

$$\csc^{-1}(z) = \frac{1}{2} i \tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right) + \frac{3\pi}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1481.01

$$\csc^{-1}(z) = \frac{\pi}{4} \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \sqrt{-\frac{i}{z}} \sqrt{iz} + \sqrt{1 + \frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) - \frac{\sqrt{z^2 - z^4}}{2z\sqrt{z^2 - 1}} \tanh^{-1}\left(\frac{z^2 - 2}{2\sqrt{1 - z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{1+z}}\right)$

01.17.27.1482.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2 i \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1483.01

$$\csc^{-1}(z) = 2 i \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1484.01

$$\csc^{-1}(z) = 2 i \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1485.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - 2 \sqrt{-\frac{1}{z^2}} z \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \tanh^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right)$

01.17.27.1486.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1487.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1488.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1489.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) + \frac{2\sqrt{z}}{\sqrt{-z}} \tanh^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right)$

01.17.27.1490.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \tanh^{-1}\left(\sqrt{\frac{1-z}{z+1}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1491.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\sqrt{\frac{1-z}{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1492.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\sqrt{\frac{1-z}{z+1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1493.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) - \frac{2\sqrt{1-z}}{\sqrt{\frac{1}{z}} \sqrt{z+1}} \sqrt{-\frac{z+1}{z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{1-z}}\right)$

01.17.27.1494.01

$$\csc^{-1}(z) = -2i \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1495.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1496.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1497.01

$$\csc^{-1}(z) = -\frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z-1}} \sqrt{z-1} - 1 \right) - 2\sqrt{\frac{1+z}{1-z}} z \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1-z}{1+z}} \tanh^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z-1}}\right)$

01.17.27.1498.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1499.01

$$\csc^{-1}(z) = -2i \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1500.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{\sqrt{-1-z}}{\sqrt{z-1}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1501.01

$$\csc^{-1}(z) = \frac{2\sqrt{z}}{\sqrt{-z}} \tanh^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z-1}}\right) - \frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z-1}} \sqrt{z-1} - 1 \right)$$

Involving $\csc^{-1}(z)$ and $\tanh^{-1}\left(\sqrt{\frac{1+z}{1-z}}\right)$

01.17.27.1502.01

$$\csc^{-1}(z) = -2i \tanh^{-1}\left(\sqrt{\frac{z+1}{1-z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1503.01

$$\csc^{-1}(z) = 2i \tanh^{-1}\left(\sqrt{\frac{z+1}{1-z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1504.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\sqrt{\frac{z+1}{1-z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1505.01

$$\csc^{-1}(z) = -\frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z-1}} \sqrt{z-1} - 1 \right) - \frac{2}{\sqrt{\frac{1}{z}}} \sqrt{\frac{1}{z+1}} \sqrt{-\frac{z+1}{z}} \tanh^{-1}\left(\sqrt{\frac{z+1}{1-z}}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tanh^{-1}(iz)$

01.17.27.1506.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \tanh^{-1}(iz) ; |z| < 1$$

01.17.27.1507.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi + 2i \tanh^{-1}(iz) ; |z| > 1 \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1508.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \tanh^{-1}(iz) - \pi ; |z| > 1 \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.17.27.1509.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{z} + 2i \tanh^{-1}(iz) ; |z| > 1$$

01.17.27.1510.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{2z} \left(1 - \frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2}\right) - \frac{2i(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \tanh^{-1}(iz)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tanh^{-1}\left(\frac{i}{z}\right)$

01.17.27.1511.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi + 2i \tanh^{-1}\left(\frac{i}{z}\right) ; |z| < 1 \wedge -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.1512.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \tanh^{-1}\left(\frac{i}{z}\right) - \pi ; |z| < 1 \wedge \left(\frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}\right)$$

01.17.27.1513.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi z \sqrt{\frac{1}{z^2}} + 2i \tanh^{-1}\left(\frac{i}{z}\right) ; |z| < 1$$

01.17.27.1514.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \tanh^{-1}\left(\frac{i}{z}\right) ; |z| > 1$$

01.17.27.1515.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2 + 1} \right)} + \frac{2i(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \tanh^{-1}\left(\frac{i}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\tanh^{-1}(iz')$

01.17.27.1516.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \tanh^{-1}\left(iz \frac{\sqrt{\left(\frac{z+1}{z-1}\right)^2}}{z+1}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.17.27.1517.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \tanh^{-1}(\sqrt{z}) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1518.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2i \tanh^{-1}(\sqrt{z}); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1519.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \tanh^{-1}(\sqrt{z}) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1520.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z} - \frac{1}{2}}\right)\pi + \frac{2\sqrt{(1-z)z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1521.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1522.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1523.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1524.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + \frac{2 \sqrt{(1-z)z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1525.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1526.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1527.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1528.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) - 2 \sqrt{\frac{1}{z} - 1} \sqrt{\frac{1}{1-z}} \sqrt{-z} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.17.27.1529.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \tanh^{-1}(\sqrt{z}) - \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1530.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} + 2i \tanh^{-1}(\sqrt{z}); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1531.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \tanh^{-1}(\sqrt{z}) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1532.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\pi \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2} \right) - \frac{2 \sqrt{(1-z)z}}{\sqrt{-z}} \sqrt{\frac{1}{1-z}} \tanh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1533.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1534.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1535.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{3\pi}{2} + 2i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1536.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{1}{2}\pi \left(2\sqrt{\frac{1}{1-z}}\sqrt{1-z} - 2\sqrt{-\frac{1}{z}}\sqrt{-z} - 1 \right) - \frac{2\sqrt{(1-z)z}}{\sqrt{-z}}\sqrt{\frac{1}{1-z}}\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1537.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1538.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1539.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{3\pi}{2} + 2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1540.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} \left(2\sqrt{\frac{1}{1-z}}\sqrt{1-z} - 2\sqrt{-\frac{1}{z}}\sqrt{-z} - 1 \right) + 2\sqrt{\frac{1-z}{z}}\sqrt{\frac{1}{1-z}}\sqrt{-z}\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tanh^{-1}(\sqrt{-z})$

01.17.27.1541.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \tanh^{-1}(\sqrt{-z}) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1542.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} + 2i \tanh^{-1}(\sqrt{-z}); -\pi < \arg(z) \leq 0$$

01.17.27.1543.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \tanh^{-1}(\sqrt{-z}) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1544.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \pi \left(\sqrt{1+z} \sqrt{\frac{1}{1+z}} - \frac{1}{2} \right) + \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \tanh^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.1545.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2}; \text{Im}(z) > 0$$

01.17.27.1546.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1547.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1548.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{1}{2}\pi \left(2\sqrt{\frac{1}{1+z}} \sqrt{1+z} - 2\sqrt{\frac{1}{z}} \sqrt{z} - 1 \right) + \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.1549.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1550.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi}{2}; 0 \leq \arg(z) < \pi$$

01.17.27.1551.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1552.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} \left(2\sqrt{\frac{1}{1+z}} \sqrt{1+z} - 2\sqrt{\frac{1}{z}} \sqrt{z} - 1 \right) - 2\sqrt{\frac{-1-z}{z}} \sqrt{\frac{1}{1+z}} \sqrt{z} \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tanh^{-1}(\sqrt{-z})$

01.17.27.1553.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \tanh^{-1}(\sqrt{-z}) - \frac{\pi}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1554.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} - 2i \tanh^{-1}(\sqrt{-z}) /; -\pi < \arg(z) \leq 0$$

01.17.27.1555.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \tanh^{-1}(\sqrt{-z}) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1556.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\pi \left(\sqrt{1+z} \sqrt{\frac{1}{1+z} - \frac{1}{2}} - \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \tanh^{-1}(\sqrt{-z}) \right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.1557.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) > 0$$

01.17.27.1558.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi}{2} /; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1559.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{3\pi}{2} + 2i \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1560.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = \frac{1}{2}\pi \left(-2\sqrt{\frac{1}{1+z}} \sqrt{1+z} + 2\sqrt{\frac{1}{z}} \sqrt{z} + 1 \right) - \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \tanh^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.1561.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{\pi}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1562.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \tanh^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{\pi}{2} /; 0 \leq \arg(z) < \pi$$

01.17.27.1563.01

$$\operatorname{csc}^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{3\pi}{2} + 2i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1564.01

$$\operatorname{csc}^{-1}\left(\frac{z+1}{z-1}\right) = \frac{\pi}{2} \left(-2\sqrt{\frac{1}{1+z}} \sqrt{1+z} + 2\sqrt{\frac{1}{z}} \sqrt{z+1} \right) + 2\sqrt{\frac{-1-z}{z}} \sqrt{\frac{1}{1+z}} \sqrt{z} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right)$ and $\tanh^{-1}(z)$

01.17.27.1565.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \tanh^{-1}(z) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1566.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} - 2i \tanh^{-1}(z); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1567.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \tanh^{-1}(z) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1568.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = -2i \tanh^{-1}(z) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0036.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} - \frac{2\sqrt{-z^2} \tanh^{-1}(z)}{z}; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.1569.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \pi \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} - \frac{3}{2} \right) + \frac{2z}{\sqrt{-z^2}} \sqrt{\frac{1+z}{1-z}} \sqrt{\frac{1-z}{1+z}} \tanh^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1570.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1571.01

$$\operatorname{csc}^{-1}\left(\frac{1-z^2}{1+z^2}\right) = -2i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1572.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1573.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{3\pi}{2} + 2i \tanh^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1574.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{z^2}} \sqrt{z^2} \sqrt{z^2-1} \sqrt{\frac{1}{z^2-1}} \right) - \frac{1}{\sqrt{z-1}} \left(2 \sqrt{-\frac{z+1}{z}} \sqrt{1-z} \sqrt{-\frac{z}{z+1}} \right) \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$

Involving $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$ and $\tanh^{-1}(z)$

01.17.27.1575.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \tanh^{-1}(z) - \frac{\pi}{2} /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1576.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} + 2i \tanh^{-1}(z) /; \text{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1577.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \tanh^{-1}(z) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1578.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = 2i \tanh^{-1}(z) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1579.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} + \frac{2\sqrt{-z^2}}{z} \tanh^{-1}(z) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.1580.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} \left(2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} + 2 \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 3 \right) + \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1581.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; \text{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1582.01

$$\csc^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right) = 2i \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1583.01

$$\csc^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right) = -\frac{3\pi}{2} + 2i \tanh^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1584.01

$$\csc^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right) = -\frac{3\pi}{2} - 2i \tanh^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1585.01

$$\csc^{-1}\left(\frac{z^2 - 1}{z^2 + 1}\right) = -\frac{1}{2}\pi \left(3 - 2\sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} - 2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}(\sqrt{1-z})$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\tanh^{-1}(\sqrt{z})$

01.17.27.1586.01

$$\csc^{-1}(\sqrt{1-z}) = i \tanh^{-1}(\sqrt{z}) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1587.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - i \tanh^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.17.27.0037.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \tanh^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1588.01

$$\csc^{-1}(\sqrt{1-z}) = -i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1589.01

$$\csc^{-1}(\sqrt{1-z}) = i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1590.01

$$\csc^{-1}(\sqrt{1-z}) = \pi - i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1591.01

$$\csc^{-1}(\sqrt{1-z}) = -\frac{\pi}{2} \left(\sqrt{-z} \sqrt{-\frac{1}{z}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1 \right) - \frac{\sqrt{-z}}{\sqrt{z}} \tanh^{-1} \left(\frac{1}{\sqrt{z}} \right)$$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\tanh^{-1} \left(\sqrt{\frac{1}{z}} \right)$

01.17.27.1592.01

$$\csc^{-1}(\sqrt{1-z}) = -i \tanh^{-1} \left(\sqrt{\frac{1}{z}} \right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1593.01

$$\csc^{-1}(\sqrt{1-z}) = i \tanh^{-1} \left(\sqrt{\frac{1}{z}} \right) /; 0 < \arg(z) < \pi$$

01.17.27.1594.01

$$\csc^{-1}(\sqrt{1-z}) = \pi - i \tanh^{-1} \left(\sqrt{\frac{1}{z}} \right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1595.01

$$\csc^{-1}(\sqrt{1-z}) = -\frac{\pi}{2} \left(\sqrt{-z} \sqrt{-\frac{1}{z}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1 \right) - \sqrt{-z} \sqrt{\frac{1}{z}} \tanh^{-1} \left(\sqrt{\frac{1}{z}} \right)$$

Involving $\csc^{-1} \left(\frac{\sqrt{z-a}}{\sqrt{z}} \right)$

Involving $\csc^{-1} \left(\frac{\sqrt{z-a}}{\sqrt{z}} \right)$ and $\tanh^{-1} \left(\sqrt{\frac{z}{a}} \right)$

01.17.27.1596.01

$$\csc^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{z}} \right) = -i \tanh^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1597.01

$$\csc^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{z}} \right) = i \tanh^{-1}(\sqrt{z}) /; -\pi < \arg(z) < 0$$

01.17.27.1598.01

$$\csc^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{z}} \right) = \pi - i \tanh^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0043.02

$$\csc^{-1} \left(\frac{\sqrt{z-1}}{\sqrt{z}} \right) = \frac{1}{2} \left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}} \right) \pi - \sqrt{-\frac{1}{z}} \sqrt{z} \tanh^{-1}(\sqrt{z})$$

01.17.27.0042.02

$$\csc^{-1}\left(\frac{\sqrt{z-a}}{\sqrt{z}}\right) = \frac{1}{2}\left(1 - \sqrt{a-z} \sqrt{\frac{1}{a-z}}\right)\pi - \sqrt{-\frac{1}{z}} \sqrt{z} \tanh^{-1}\left(\sqrt{\frac{z}{a}}\right); a > 0$$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1599.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.1600.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1601.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1602.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 \leq \arg[z] < \pi$$

01.17.27.1603.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1604.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.17.27.1605.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \tanh^{-1}(\sqrt{z}); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1606.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \tanh^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.17.27.1607.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \pi - i \tanh^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1608.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \left(\frac{\sqrt{-z}}{\sqrt{z}} \tanh^{-1}(\sqrt{z}) - \frac{\pi}{2} \right) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1609.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1610.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0$$

01.17.27.1611.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1612.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2} \sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}}$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1613.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1614.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1615.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1616.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{z}-1} \sqrt{\frac{1}{1-z}} \sqrt{-z} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}}$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\tanh^{-1}(\sqrt{z})$

01.17.27.1617.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \tanh^{-1}(\sqrt{z}) /; \operatorname{Im}(z) < 0$$

01.17.27.1618.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \tanh^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1619.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \pi - i \tanh^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.0044.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -\sqrt{-\frac{1}{z}} \sqrt{z} \tanh^{-1}(\sqrt{z}) + \frac{\pi}{2} \left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1620.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) /; \operatorname{Im}(z) \geq 0$$

01.17.27.1621.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0$$

01.17.27.1622.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \tanh^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1623.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) /; 0 \leq \arg(z) < \pi$$

01.17.27.1624.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1625.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \tanh^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$ and $\tanh^{-1}(z)$

01.17.27.1626.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{\pi}{2} - i \tanh^{-1}(z) /; -\pi < \arg(z) \leq 0$$

01.17.27.1627.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{\pi}{2} + i \tanh^{-1}(z) /; 0 < \arg(z) \leq \pi$$

01.17.27.1628.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{z}{\sqrt{-z^2}} \tanh^{-1}(z) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1629.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1630.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = -i \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1631.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) + \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1632.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = -i \tanh^{-1}\left(\frac{1}{z}\right) + \pi /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1633.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = -\frac{\sqrt{-z^2}}{z} \tanh^{-1}\left(\frac{1}{z}\right); z \notin (-1, 1)$$

01.17.27.1634.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{z}{\sqrt{-z^2}} \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi i}{2} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}} \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\tanh^{-1}(z)$

01.17.27.1635.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \tanh^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1636.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \tanh^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1637.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \pi - i \tanh^{-1}(z); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1638.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\pi - i \tanh^{-1}(z); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.0038.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\sqrt{\frac{1}{1-z^2}} \sqrt{z^2-1} \tanh^{-1}(z); z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.0039.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} \left(\sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{\frac{1}{1-z}} \sqrt{1-z} \right) - \sqrt{\frac{1}{1-z^2}} \sqrt{z^2-1} \tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1639.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1640.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} + i \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1641.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1642.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1643.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi \sqrt{z^2}}{2z} - \sqrt{\frac{1}{1-z^2}} \sqrt{z^2-1} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\tanh^{-1}(z)$

01.17.27.1644.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i \tanh^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1645.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = i \tanh^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1646.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi - i \tanh^{-1}(z) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1647.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi + i \tanh^{-1}(z) /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1648.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{1}{2}\pi\left(2 - \sqrt{\frac{1}{1-z}}\sqrt{1-z} - \sqrt{\frac{1}{z+1}}\sqrt{z+1}\right) - z\sqrt{-\frac{1}{z^2}}\tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1649.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} + i\tanh^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1650.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; 0 \leq \arg(z) < \pi$$

01.17.27.1651.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} - z\sqrt{-\frac{1}{z^2}}\tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\tanh^{-1}(z)$

01.17.27.1652.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i\tanh^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1653.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i\tanh^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1654.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \pi - i\tanh^{-1}(z) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1655.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i\tanh^{-1}(z) + \pi /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1656.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}\sqrt{z^2-1}}{\sqrt{z^2(1-z^2)}}\left(\frac{\pi}{2}\left(-\sqrt{\frac{1}{1-z}}\sqrt{1-z}-\sqrt{\frac{1}{z+1}}\sqrt{z+1}+2\right)-\sqrt{-\frac{1}{z^2}}z\tanh^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1657.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1658.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1659.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1660.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1661.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2}\sqrt{z^2-1}}{\sqrt{z^2(1-z^2)}}\left(\frac{\pi}{2}-\sqrt{-\frac{1}{z^2}}z\tanh^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\tanh^{-1}(z)$

01.17.27.1662.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \tanh^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1663.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -i \tanh^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1664.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi - i \tanh^{-1}(z) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1665.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \tanh^{-1}(z) + \pi /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1666.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi}{2} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 2 \right) - \frac{1}{\sqrt{\frac{1}{z}}} \sqrt{-\frac{1}{z}} \tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1667.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1668.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi}{2} - i \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0$$

01.17.27.1669.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi}{2} - \frac{1}{\sqrt{\frac{1}{z}}} \sqrt{-\frac{1}{z}} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\csc^{-1}\left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1}\right)$ and $\tanh^{-1}(z)$

01.17.27.1670.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{1}{2} i \tanh^{-1}(z) ; -\pi < \arg(z) \leq 0$$

01.17.27.1671.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = -\frac{i}{2} \tanh^{-1}(z) ; 0 < \arg(z) \leq \pi$$

01.17.27.1672.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{\sqrt{-z^2}}{2z} \tanh^{-1}(z)$$

Involving $\operatorname{csc}^{-1} \left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1} \right)$ and $\tanh^{-1} \left(\frac{1}{z} \right)$

01.17.27.1673.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{\pi}{4} - \frac{1}{2} i \tanh^{-1} \left(\frac{1}{z} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1674.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{1}{2} i \tanh^{-1} \left(\frac{1}{z} \right) + \frac{\pi}{4} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1675.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = -\frac{\pi}{4} - \frac{1}{2} i \tanh^{-1} \left(\frac{1}{z} \right) ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1676.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{1}{2} i \tanh^{-1} \left(\frac{1}{z} \right) - \frac{\pi}{4} ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1677.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z^2}}{2z} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi \sqrt{-z^2} \sqrt{z^2-1}}{4\sqrt{z^2-z^4}}$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2} (z^2-1)^{1/4} / \sqrt{\sqrt{z^2-1}-z}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2} (z^2-1)^{1/4} / \sqrt{\sqrt{z^2-1}-z}\right)$ and $\tanh^{-1}(z)$

01.17.27.1678.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2} i \tanh^{-1}(z) + \frac{\pi}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1679.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} - \frac{1}{2} i \tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1680.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2} i \tanh^{-1}(z) - \frac{\pi}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1681.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2} i \tanh^{-1}(z) + \frac{3\pi}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1682.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2} \sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{z+1} \sqrt{\frac{1}{z+1} + 1} \right) + \frac{1}{2} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{2} (z^2 - 1)^{1/4} / \sqrt{\sqrt{z^2 - 1} - z}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1683.01

$$\csc^{-1}\left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}}\right) = \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1684.01

$$\csc^{-1}\left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}}\right) = -\frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1685.01

$$\csc^{-1}\left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}}\right) = \frac{\pi}{2} - \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1686.01

$$\csc^{-1}\left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}}\right) = \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1687.01

$$\csc^{-1}\left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}}\right) = \frac{\pi}{4} \left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{1}{2} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{2\sqrt{1-z^2}} / (\sqrt{1-z^2} - 1)\right)$

Involving $\csc^{-1}\left(\sqrt{2\sqrt{1-z^2}} / (\sqrt{1-z^2} - 1)\right)$ and $\tanh^{-1}(z)$

01.17.27.1688.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}i \tanh^{-1}(z) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1689.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}i \tanh^{-1}(z) /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1690.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z^2}}z\sqrt{\frac{z+1}{1-z}}\sqrt{\frac{1-z}{z+1}}\tanh^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1691.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{\pi}{4} - \frac{1}{2}i \tanh^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1692.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}i \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1693.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z-1}\sqrt{-z}}{2\sqrt{(1-z)z}}\sqrt{\frac{z-1}{z+1}}\tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4}$$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right)$ and $\tanh^{-1}(z)$

01.17.27.1694.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}i \tanh^{-1}(z) + \frac{\pi}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1695.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} - \frac{1}{2}i \tanh^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1696.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}i \tanh^{-1}(z) + \frac{3\pi}{4} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1697.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} \left(2 - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right) + \frac{1}{2} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \tanh^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right)$ and $\tanh^{-1}\left(\frac{1}{z}\right)$

01.17.27.1698.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1699.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = -\frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1700.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{2} - \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1701.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{i}{2} \tanh^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1702.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} \left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{1}{2} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \tanh^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{az^c}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{a z^c}\right)$ and $\tanh^{-1}(a z^c)$

01.17.27.1703.01

$$\csc^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{a z^c}\right) = \frac{1}{2} \pi \left(\sqrt{\frac{1}{a z^c+1}} \sqrt{a z^c+1} - \sqrt{\frac{1}{1-a z^c}} \sqrt{1-a z^c} \right) - \sqrt{\frac{1}{1-a^2 z^{2c}}} \sqrt{a^2 z^{2c}-1} \tanh^{-1}(a z^c)$$

Involving \coth^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\sqrt{1-z^2}\right)$

01.17.27.1704.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\sqrt{1-z^2}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1705.01

$$\csc^{-1}(z) = -i \coth^{-1}\left(\sqrt{1-z^2}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1706.01

$$\csc^{-1}(z) = \pi - i \coth^{-1}\left(\sqrt{1-z^2}\right) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1707.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\sqrt{1-z^2}\right) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1708.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) + \frac{\sqrt{z^2-z^4}}{z \sqrt{z^2-1}} \coth^{-1}\left(\sqrt{1-z^2}\right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$

01.17.27.1709.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1710.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1711.01

$$\csc^{-1}(z) = -i \coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \quad \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1712.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1713.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\sqrt{1-z^2}}{\sqrt{z^2-1}} \coth^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) + \frac{\pi}{2} \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$

01.17.27.1714.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1715.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1716.01

$$\csc^{-1}(z) = -i \coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1717.01

$$\csc^{-1}(z) = i \coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \quad \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1718.01

$$\csc^{-1}(z) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \sqrt{z^2-1} \sqrt{\frac{1}{1-z^2}} \coth^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right)$

01.17.27.1719.01

$$\csc^{-1}(z) = \frac{\pi}{4} + \frac{1}{2} i \coth^{-1}\left(\frac{2\sqrt{1-z^2}}{z^2-2}\right) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1720.01

$$\csc^{-1}(z) = \frac{\pi}{4} - \frac{1}{2} i \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right); -\frac{\pi}{2} < \arg(z) < 0 \quad \vee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1721.01

$$\csc^{-1}(z) = -\frac{\pi}{4} + \frac{1}{2} i \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right); \frac{\pi}{2} < \arg(z) < \pi \quad \vee \quad (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1722.01

$$\csc^{-1}(z) = -\frac{\pi}{4} - \frac{1}{2} i \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.1723.01

$$\csc^{-1}(z) = -\frac{1}{2} i \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right) - \frac{3\pi}{4}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1724.01

$$\csc^{-1}(z) = \frac{1}{2} i \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right) + \frac{3\pi}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1725.01

$$\csc^{-1}(z) = \frac{\pi}{4} \left(\sqrt{\frac{1}{z^2}} z - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} + \sqrt{\frac{i}{z}} \sqrt{-iz} - \sqrt{-\frac{i}{z}} \sqrt{iz} + \sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} \right) - \frac{\sqrt{z^2-z^4}}{2z\sqrt{z^2-1}} \coth^{-1} \left(\frac{2\sqrt{1-z^2}}{z^2-2} \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right)$

01.17.27.1726.01

$$\csc^{-1}(z) = \frac{z\sqrt{z^2}}{2\sqrt{-z^4}} \coth^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right); \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4} \quad \vee \quad |z| \geq \sqrt{2}$$

01.17.27.1727.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \sqrt{\frac{z}{\sqrt{2}-z}} \sqrt{\frac{1}{z}} \sqrt{\frac{\sqrt{2}-z}{z}} \sqrt{z} - \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\frac{z}{z+\sqrt{2}}} \sqrt{-\frac{z+\sqrt{2}}{z}} + \frac{\sqrt{\frac{1-z^2}{z^2}}}{\sqrt{\frac{1-z^2}{z^4}} z} \right) - \frac{2\sqrt{z^2}\sqrt{1-z^2}}{z\sqrt{z^2-1}} \coth^{-1} \left(\frac{z^2-2}{2\sqrt{1-z^2}} \right) \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{1+z}}\right)$

01.17.27.1728.01

$$\csc^{-1}(z) = -2i \coth^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1729.01

$$\csc^{-1}(z) = 2i \coth^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1730.01

$$\csc^{-1}(z) = -2i \coth^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1731.01

$$\csc^{-1}(z) = -\frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{z-1} \sqrt{\frac{1}{z-1} - 1} - 2\sqrt{\frac{z+1}{1-z}} z \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1-z}{z+1}} \coth^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{z+1}}\right) \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right)$

01.17.27.1732.01

$$\csc^{-1}(z) = 2i \coth^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right) - \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1733.01

$$\csc^{-1}(z) = -2i \coth^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1734.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \coth^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1735.01

$$\csc^{-1}(z) = \frac{2\sqrt{z}}{\sqrt{-z}} \coth^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{-z-1}}\right) - \frac{\pi}{2} \left(2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z-1}} \sqrt{z-1} - 1 \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right)$

01.17.27.1736.01

$$\csc^{-1}(z) = 2i \coth^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1737.01

$$\csc^{-1}(z) = -2i \operatorname{coth}^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right) - \frac{\pi}{2}; 0 < \arg(z) < \pi$$

01.17.27.1738.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \operatorname{coth}^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1739.01

$$\csc^{-1}(z) = \frac{2}{\sqrt{-\frac{1}{z}}} \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z}} \operatorname{coth}^{-1}\left(\sqrt{\frac{1-z}{1+z}}\right) - \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{z-1} \sqrt{\frac{1}{z-1}} - 1\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{coth}^{-1}\left(\frac{\sqrt{1+z}}{\sqrt{1-z}}\right)$

01.17.27.1740.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1741.01

$$\csc^{-1}(z) = 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1742.01

$$\csc^{-1}(z) = 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1743.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1\right) - 2 \sqrt{-\frac{1}{z^2}} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \operatorname{coth}^{-1}\left(\frac{\sqrt{z+1}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{coth}^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z-1}}\right)$

01.17.27.1744.01

$$\csc^{-1}(z) = 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z-1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1745.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z-1}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1746.01

$$\csc^{-1}(z) = 2i \operatorname{coth}^{-1}\left(\frac{\sqrt{-z-1}}{\sqrt{z-1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1747.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 1 \right) + \frac{2\sqrt{z}}{\sqrt{-z}} \coth^{-1} \left(\frac{\sqrt{-z-1}}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\coth^{-1} \left(\sqrt{\frac{1+z}{1-z}} \right)$

01.17.27.1748.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \coth^{-1} \left(\sqrt{\frac{z+1}{1-z}} \right) ; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1749.01

$$\csc^{-1}(z) = \frac{\pi}{2} + 2i \coth^{-1} \left(\sqrt{\frac{z+1}{1-z}} \right) ; -\pi < \arg(z) < 0$$

01.17.27.1750.01

$$\csc^{-1}(z) = 2i \coth^{-1} \left(\sqrt{\frac{z+1}{1-z}} \right) - \frac{3\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1751.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(2 \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{z+1} \sqrt{\frac{1}{z+1}} - 1 \right) - \frac{2}{\sqrt{\frac{1}{z}}} \sqrt{-\frac{z+1}{z}} \sqrt{\frac{1}{z+1}} \coth^{-1} \left(\sqrt{\frac{z+1}{1-z}} \right)$$

Involving $\csc^{-1} \left(\frac{z^2+1}{2z} \right)$

Involving $\csc^{-1} \left(\frac{z^2+1}{2z} \right)$ and $\coth^{-1}(iz)$

01.17.27.1752.01

$$\csc^{-1} \left(\frac{z^2+1}{2z} \right) = \pi - 2i \coth^{-1}(iz) ; |z| < 1 \wedge -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.1753.01

$$\csc^{-1} \left(\frac{z^2+1}{2z} \right) = -2i \coth^{-1}(iz) - \pi ; |z| < 1 \wedge \left(\frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2} \right)$$

01.17.27.1754.01

$$\csc^{-1} \left(\frac{z^2+1}{2z} \right) = \pi z \sqrt{\frac{1}{z^2}} - 2i \coth^{-1}(iz) ; |z| < 1$$

01.17.27.1755.01

$$\csc^{-1} \left(\frac{z^2+1}{2z} \right) = 2i \coth^{-1}(iz) ; |z| > 1$$

01.17.27.1756.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2} \left(\frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} + 1 \right)} - \frac{2i(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \coth^{-1}(iz)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\coth^{-1}\left(\frac{i}{z}\right)$

01.17.27.1757.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \coth^{-1}\left(\frac{i}{z}\right); |z| < 1$$

01.17.27.1758.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \pi - 2i \coth^{-1}\left(\frac{i}{z}\right); |z| > 1 \wedge -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1759.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = -2i \coth^{-1}\left(\frac{i}{z}\right) - \pi; |z| > 1 \wedge \left(\frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}\right)$$

01.17.27.1760.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{z} - 2i \coth^{-1}\left(\frac{i}{z}\right); |z| > 1$$

01.17.27.1761.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = \frac{\pi \sqrt{z^2}}{2z} \left(1 - \frac{1-z}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \right) + \frac{2i(1-z)}{1+z} \sqrt{\left(\frac{z+1}{z-1}\right)^2} \coth^{-1}\left(\frac{i}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2+1}{2z}\right)$ and $\coth^{-1}(iz')$

01.17.27.1762.01

$$\csc^{-1}\left(\frac{z^2+1}{2z}\right) = 2i \coth^{-1}\left(iz \frac{(z-1)\sqrt{\left(\frac{z+1}{z-1}\right)^2}}{z+1}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1763.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \coth^{-1}(\sqrt{z}) - \frac{\pi}{2}; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1764.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = -2i \coth^{-1}(\sqrt{z}) - \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1765.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{3\pi}{2} - 2i \coth^{-1}(\sqrt{z}); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1766.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} \left(1 - 2 \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} \right) - \frac{2\sqrt{-z} \sqrt{1-z}}{\sqrt{z}} \sqrt{\frac{1}{1-z}} \coth^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1767.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1768.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1769.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1770.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2} \right) \pi - \frac{2\sqrt{-z} \sqrt{1-z}}{\sqrt{z}} \sqrt{\frac{1}{1-z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1-z}{1+z}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1771.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; 0 < \arg(z) < \pi$$

01.17.27.1772.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \frac{\pi}{2} - 2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1773.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = 2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1774.01

$$\csc^{-1}\left(\frac{1-z}{1+z}\right) = \left(\sqrt{1-z} \sqrt{\frac{1}{1-z}} - \frac{1}{2} \right) \pi - 2 \sqrt{\frac{1}{z} - 1} \sqrt{\frac{1}{1-z}} \sqrt{-z} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1775.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \coth^{-1}(\sqrt{z}) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1776.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2i \coth^{-1}(\sqrt{z}) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0$$

01.17.27.1777.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{3\pi}{2} + 2i \coth^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1778.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{1}{2}\pi \left(2\sqrt{\frac{1}{1-z}}\sqrt{1-z} - 2\sqrt{-\frac{1}{z}}\sqrt{-z} - 1 \right) - \frac{2\sqrt{(1-z)z}}{\sqrt{-z}}\sqrt{\frac{1}{1-z}}\coth^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1779.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.1780.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1781.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = \frac{3\pi}{2} - 2i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1782.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\pi \left(\sqrt{1-z}\sqrt{\frac{1}{1-z}} - \frac{1}{2} \right) - \frac{2\sqrt{(1-z)z}}{\sqrt{-z}}\sqrt{\frac{1}{1-z}}\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z-1}{z+1}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1783.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; 0 < \arg(z) < \pi$$

01.17.27.1784.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -\frac{\pi}{2} + 2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1785.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = -2i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1786.01

$$\csc^{-1}\left(\frac{z-1}{z+1}\right) = 2\sqrt{\frac{1}{z}-1}\sqrt{\frac{1}{1-z}}\sqrt{-z} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \left(\sqrt{1-z}\sqrt{\frac{1}{1-z}} - \frac{1}{2}\right)\pi$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\coth^{-1}(\sqrt{-z})$

01.17.27.1787.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \coth^{-1}(\sqrt{-z}) - \frac{\pi}{2}; \operatorname{Im}(z) > 0$$

01.17.27.1788.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \coth^{-1}(\sqrt{-z}) - \frac{\pi}{2}; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1789.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{3\pi}{2} - 2i \coth^{-1}(\sqrt{-z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1790.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{1}{2}\pi \left(2\sqrt{\frac{1}{1+z}}\sqrt{1+z} - 2\sqrt{\frac{1}{z}}\sqrt{z} - 1 \right) + \frac{2\sqrt{-(1+z)z}}{\sqrt{z}}\sqrt{\frac{1}{1+z}} \coth^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.1791.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1792.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} + 2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1793.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1794.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \pi \left(\sqrt{1+z} \sqrt{\frac{1}{1+z} - \frac{1}{2}} + \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{1+z}{1-z}\right)$ and $\coth^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.1795.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = -2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.17.27.1796.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \frac{\pi}{2} + 2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right); -\pi < \arg(z) < 0$$

01.17.27.1797.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = 2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1798.01

$$\csc^{-1}\left(\frac{1+z}{1-z}\right) = \left(\sqrt{z+1} \sqrt{\frac{1}{z+1} - \frac{1}{2}} \right) \pi - 2\sqrt{z} \sqrt{-\frac{z+1}{z}} \sqrt{\frac{1}{z+1}} \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\coth^{-1}(\sqrt{-z})$

01.17.27.1799.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \coth^{-1}(\sqrt{-z}) + \frac{\pi}{2}; \operatorname{Im}(z) > 0$$

01.17.27.1800.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \coth^{-1}(\sqrt{-z}) + \frac{\pi}{2}; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1801.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{3\pi}{2} + 2i \coth^{-1}(\sqrt{-z}); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1802.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = \frac{1}{2}\pi \left(-2\sqrt{\frac{1}{1+z}} \sqrt{1+z} + 2\sqrt{\frac{1}{z}} \sqrt{z+1} \right) - \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \coth^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.1803.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1804.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} - 2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1805.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1806.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\pi \left(\sqrt{1+z} \sqrt{\frac{1}{1+z} - \frac{1}{2}} - \frac{2\sqrt{-(1+z)z}}{\sqrt{z}} \sqrt{\frac{1}{1+z}} \coth^{-1}\left(\frac{1}{\sqrt{-z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{z+1}{z-1}\right)$ and $\coth^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.1807.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.17.27.1808.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -\frac{\pi}{2} - 2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right); -\pi < \arg(z) < 0$$

01.17.27.1809.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = -2i \coth^{-1}\left(\sqrt{-\frac{1}{z}}\right) + \frac{3\pi}{2}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1810.01

$$\csc^{-1}\left(\frac{z+1}{z-1}\right) = 2\sqrt{-1-\frac{1}{z}}\sqrt{z}\sqrt{\frac{1}{z+1}}\coth^{-1}\left(\sqrt{-\frac{1}{z}}\right) - \left(\sqrt{z+1}\sqrt{\frac{1}{z+1}-\frac{1}{2}}\right)\pi$$

Involving $\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right)$

Involving $\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right)$ and $\coth^{-1}(z)$

01.17.27.1811.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \coth^{-1}(z) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1812.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = -2i \coth^{-1}(z) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1813.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{3\pi}{2} - 2i \coth^{-1}(z) \quad ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1814.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{3\pi}{2} + 2i \coth^{-1}(z) \quad ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1815.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{1}{2}\pi \left(1 - 2\sqrt{\frac{1}{z^2}} \sqrt{z^2} \sqrt{z^2-1} \sqrt{\frac{1}{z^2-1}} \right) - \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \coth^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.17.27.1816.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1817.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} - 2i \coth^{-1}\left(\frac{1}{z}\right) \quad ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1818.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = 2i \coth^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2} \quad ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1819.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = -2i \coth^{-1}\left(\frac{1}{z}\right) - \frac{3\pi}{2} \quad ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1820.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} - \frac{2\sqrt{-z^2}}{z} \coth^{-1}\left(\frac{1}{z}\right) \quad ; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.1821.01

$$\csc^{-1}\left(\frac{1-z^2}{1+z^2}\right) = \frac{\pi}{2} \left(2\sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} - 1 \right) - \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$

Involving $\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right)$ and $\coth^{-1}(z)$

01.17.27.1822.01

$$\csc^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \coth^{-1}(z) + \frac{\pi}{2} \quad ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1823.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = 2i \operatorname{coth}^{-1}(z) + \frac{\pi}{2} /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1824.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{3\pi}{2} + 2i \operatorname{coth}^{-1}(z) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1825.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{3\pi}{2} - 2i \operatorname{coth}^{-1}(z) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1826.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{1}{2}\pi \left(3 - 2\sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{-\frac{1}{z}} \sqrt{-z} - 2\sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} \right) + \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \operatorname{coth}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right)$ and $\operatorname{coth}^{-1}\left(\frac{1}{z}\right)$

01.17.27.1827.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1828.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} + 2i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1829.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -2i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1830.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = 2i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1831.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} + \frac{2\sqrt{-z^2}}{z} \operatorname{coth}^{-1}\left(\frac{1}{z}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.1832.01

$$\operatorname{csc}^{-1}\left(\frac{z^2-1}{z^2+1}\right) = -\frac{\pi}{2} \left(2\sqrt{\frac{1}{1-z}} \sqrt{1-z} + 2\sqrt{\frac{1}{z+1}} \sqrt{z+1} - 3 \right) + \frac{2\sqrt{-z^2}}{z} \sqrt{\frac{1-z}{z+1}} \sqrt{\frac{z+1}{1-z}} \operatorname{coth}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}(\sqrt{1-z})$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1833.01

$$\csc^{-1}(\sqrt{1-z}) = -i \coth^{-1}(\sqrt{z}) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1834.01

$$\csc^{-1}(\sqrt{1-z}) = i \coth^{-1}(\sqrt{z}) /; 0 < \arg(z) \leq \pi$$

01.17.27.1835.01

$$\csc^{-1}(\sqrt{1-z}) = \pi - i \coth^{-1}(\sqrt{z}) /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1836.01

$$\csc^{-1}(\sqrt{1-z}) = -\frac{\pi}{2} \left(\sqrt{-z} \sqrt{-\frac{1}{z}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1 \right) - \frac{\sqrt{-z}}{\sqrt{z}} \coth^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1837.01

$$\csc^{-1}(\sqrt{1-z}) = i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; 0 < \arg(z) \leq \pi$$

01.17.27.1838.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) /; -\pi < \arg(z) \leq 0$$

01.17.27.1839.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}(\sqrt{1-z})$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1840.01

$$\csc^{-1}(\sqrt{1-z}) = i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; 0 < \arg(z) < \pi$$

01.17.27.1841.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) /; \operatorname{Im}(z) \leq 0$$

01.17.27.1842.01

$$\csc^{-1}(\sqrt{1-z}) = \frac{\pi}{2} - \sqrt{-z} \sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1843.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - i \coth^{-1}(\sqrt{z}) ; \operatorname{Im}(z) \geq 0$$

01.17.27.1844.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \coth^{-1}(\sqrt{z}) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0$$

01.17.27.0046.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \coth^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1845.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) ; 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1846.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) ; -\pi < \arg(z) < 0$$

01.17.27.1847.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \pi - i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) ; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1848.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{1-z}} \sqrt{1-z}\right) + \sqrt{\frac{1}{1-z}} (-\sqrt{z-1}) \coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1849.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = -i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) ; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1850.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1851.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \pi - i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1852.01

$$\csc^{-1}\left(\frac{\sqrt{z-1}}{\sqrt{z}}\right) = \frac{1}{2}\pi \left(1 - \sqrt{\frac{1}{1-z}} \sqrt{1-z}\right) - \sqrt{z-1} \sqrt{\frac{1}{z}} \sqrt{\frac{z}{1-z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1853.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\pi}{2} - i \coth^{-1}(\sqrt{z}); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1854.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \coth^{-1}(\sqrt{z}) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1855.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \coth^{-1}(\sqrt{z}) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1856.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2} \sqrt{1-z}}{z} \sqrt{\frac{1}{1-z}} \coth^{-1}(\sqrt{z}) + \frac{\pi}{2} \sqrt{\frac{z}{z-1}} \sqrt{\frac{z-1}{z}}$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1857.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1858.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1859.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \pi - i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1860.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \left(\frac{\sqrt{-z}}{\sqrt{z}} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2}\right) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1861.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = -i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 < \arg(z) < \pi$$

01.17.27.1862.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1863.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \pi - i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1864.01

$$\csc^{-1}\left(\frac{\sqrt{1-z}}{\sqrt{-z}}\right) = \sqrt{\frac{1}{1-z}} \sqrt{1-z} \left(\sqrt{-z} \sqrt{\frac{1}{z}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}\right) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\coth^{-1}(\sqrt{z})$

01.17.27.1865.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - i \coth^{-1}(\sqrt{z}); \operatorname{Im}(z) \geq 0$$

01.17.27.1866.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \coth^{-1}(\sqrt{z}) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.0045.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \coth^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.1867.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.1868.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.17.27.1869.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \pi - i \coth^{-1}\left(\frac{1}{\sqrt{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1870.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}}\right) - \sqrt{-\frac{1}{z}} \sqrt{z} \coth^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right)$ and $\coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.1871.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = -i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1872.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1873.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \pi - i \coth^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1874.01

$$\csc^{-1}\left(\sqrt{\frac{z-1}{z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{1-z} \sqrt{\frac{1}{1-z}}\right) - z \sqrt{-\frac{1}{z^2}} \coth^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$ and $\coth^{-1}(z)$

01.17.27.1875.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = i \coth^{-1}(z) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1876.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = -i \coth^{-1}(z) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1877.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = i \coth^{-1}(z) + \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1878.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = -i \coth^{-1}(z) + \pi /; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0047.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{z}{\sqrt{-z^2}} \coth^{-1}(z) /; z \notin (-1, 1)$$

01.17.27.0048.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{z}{\sqrt{-z^2}} \coth^{-1}(z) - \frac{\pi i}{2} \left(\frac{\sqrt{-z-1}}{\sqrt{z+1}} + \frac{\sqrt{z-1}}{\sqrt{1-z}} \right)$$

Involving $\csc^{-1}\left(\sqrt{1-z^2}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.17.27.1879.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{\pi}{2} - i \coth^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq 0$$

01.17.27.1880.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{\pi}{2} + i \coth^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \pi$$

01.17.27.1881.01

$$\csc^{-1}\left(\sqrt{1-z^2}\right) = \frac{z}{\sqrt{-z^2}} \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\coth^{-1}(z)$

01.17.27.1882.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} - i \coth^{-1}(z) /; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1883.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} + i \coth^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1884.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \coth^{-1}(z) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1885.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \coth^{-1}(z) - \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1886.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi \sqrt{z^2}}{2z} - \sqrt{\frac{1}{1-z^2}} \sqrt{z^2-1} \coth^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.17.27.1887.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -i \coth^{-1}\left(\frac{1}{z}\right) /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1888.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = i \coth^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1889.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \pi - i \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1890.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\pi - i \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1891.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = -\sqrt{z^2-1} \sqrt{\frac{1}{1-z^2}} \coth^{-1}\left(\frac{1}{z}\right) /; z \notin (-\infty, -1) \wedge z \notin (1, \infty)$$

01.17.27.1892.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right) = \frac{\pi}{2} \left(\sqrt{\frac{1}{z+1}} \sqrt{z+1} - \sqrt{\frac{1}{1-z}} \sqrt{1-z} \right) - \sqrt{\frac{1}{1-z^2}} \sqrt{z^2-1} \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\coth^{-1}(z)$

01.17.27.1893.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} + i \coth^{-1}(z) /; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1894.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i \coth^{-1}(z) + \frac{\pi}{2} /; 0 \leq \arg(z) < \pi$$

01.17.27.1895.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \coth^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.17.27.1896.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = -i \coth^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1897.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = i \coth^{-1}\left(\frac{1}{z}\right) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1898.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi - i \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1899.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \pi + i \coth^{-1}\left(\frac{1}{z}\right) /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1900.01

$$\csc^{-1}\left(\frac{\sqrt{z^2-1}}{\sqrt{z^2}}\right) = \frac{1}{2} \pi \left(-\sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} + 2 \right) - \sqrt{-\frac{1}{z^2}} z \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\coth^{-1}(z)$

01.17.27.1901.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \coth^{-1}(z) + \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1902.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\pi}{2} - i \coth^{-1}(z); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1903.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i \coth^{-1}(z) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1904.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \coth^{-1}(z) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1905.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2} \sqrt{z^2-1}}{\sqrt{z^2(1-z^2)}} \left(\frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \coth^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right)$ and $\coth^{-1}\left(\frac{1}{z}\right)$

01.17.27.1906.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1907.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = -i \coth^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1908.01

$$\csc^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \pi - i \coth^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1909.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) + \pi ; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1910.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{1-z^2}}{\sqrt{-z^2}}\right) = \frac{\sqrt{-z^2} \sqrt{z^2-1}}{\sqrt{z^2(1-z^2)}} \left(\frac{\pi}{2} \left(-\sqrt{\frac{1}{1-z}} \sqrt{1-z} - \sqrt{\frac{1}{z+1}} \sqrt{z+1} + 2 \right) - \sqrt{-\frac{1}{z^2}} z \operatorname{coth}^{-1}\left(\frac{1}{z}\right) \right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\operatorname{coth}^{-1}(z)$

01.17.27.1911.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \operatorname{coth}^{-1}(z) + \frac{\pi}{2} ; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1912.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi}{2} - i \operatorname{coth}^{-1}(z) ; 0 \leq \arg(z) < \pi$$

01.17.27.1913.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \frac{\pi}{2} - z \sqrt{-\frac{1}{z^2}} \operatorname{coth}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right)$ and $\operatorname{coth}^{-1}\left(\frac{1}{z}\right)$

01.17.27.1914.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1915.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1916.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = \pi - i \coth^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1917.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = i \coth^{-1}\left(\frac{1}{z}\right) + \pi; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1918.01

$$\csc^{-1}\left(\sqrt{\frac{z^2-1}{z^2}}\right) = -\frac{\pi}{2} \left(\sqrt{\frac{1}{1-z}} \sqrt{1-z} + \sqrt{\frac{1}{z+1}} \sqrt{z+1} - 2 \right) - z \sqrt{-\frac{1}{z^2}} \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1}\right)$

Involving $\csc^{-1}\left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1}\right)$ and $\coth^{-1}(z)$

01.17.27.1919.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{\pi}{4} - \frac{1}{2} i \coth^{-1}(z); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1920.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2} i \coth^{-1}(z) + \frac{\pi}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1921.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = -\frac{\pi}{4} - \frac{1}{2} i \coth^{-1}(z); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1922.01

$$\csc^{-1}\left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}}\right) = \frac{1}{2} i \coth^{-1}(z) - \frac{\pi}{4}; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1923.01

$$\csc^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{\sqrt{-z^2}}{2z} \coth^{-1}(z) + \frac{\pi \sqrt{-z^2} \sqrt{z^2-1}}{4 \sqrt{z^2-z^4}}$$

Involving $\csc^{-1} \left(\sqrt{2} (1-z^2)^{1/4} / \sqrt{\sqrt{1-z^2}-1} \right)$ and $\coth^{-1} \left(\frac{1}{z} \right)$

01.17.27.1924.01

$$\csc^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{i}{2} \coth^{-1} \left(\frac{1}{z} \right); -\pi < \arg(z) \leq 0$$

01.17.27.1925.01

$$\csc^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = -\frac{i}{2} \coth^{-1} \left(\frac{1}{z} \right); 0 < \arg(z) \leq \pi$$

01.17.27.1926.01

$$\csc^{-1} \left(\frac{\sqrt{2} \sqrt[4]{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = \frac{\sqrt{-z^2}}{2z} \coth^{-1} \left(\frac{1}{z} \right)$$

Involving $\csc^{-1} \left(\sqrt{2} (z^2-1)^{1/4} / \sqrt{\sqrt{z^2-1}-z} \right)$

Involving $\csc^{-1} \left(\sqrt{2} (z^2-1)^{1/4} / \sqrt{\sqrt{z^2-1}-z} \right)$ and $\coth^{-1}(z)$

01.17.27.1927.01

$$\csc^{-1} \left(\frac{\sqrt{2} (z^2-1)^{1/4}}{\sqrt{\sqrt{z^2-1}-z}} \right) = \frac{i}{2} \coth^{-1}(z); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.1928.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = -\frac{i}{2} \operatorname{coth}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1929.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{\pi}{2} - \frac{i}{2} \operatorname{coth}^{-1}(z) /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1930.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{i}{2} \operatorname{coth}^{-1}(z) + \frac{\pi}{2} /; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1931.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{\pi}{4} \left(1 - \frac{\sqrt{z^2}}{z} \right) + \frac{1}{2} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \operatorname{coth}^{-1}(z)$$

Involving $\operatorname{csc}^{-1} \left(\frac{\sqrt{2} (z^2 - 1)^{1/4}}{\sqrt{\sqrt{z^2 - 1} - z}} \right)$ and $\operatorname{coth}^{-1} \left(\frac{1}{z} \right)$

01.17.27.1932.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2 - 1}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{1}{2} i \operatorname{coth}^{-1} \left(\frac{1}{z} \right) + \frac{\pi}{4} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1933.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2 - 1}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{\pi}{4} - \frac{1}{2} i \operatorname{coth}^{-1} \left(\frac{1}{z} \right) /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1934.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2} \sqrt[4]{z^2 - 1}}{\sqrt{\sqrt{z^2 - 1} - z}} \right) = \frac{1}{2} i \operatorname{coth}^{-1} \left(\frac{1}{z} \right) - \frac{\pi}{4} /; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1935.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}i \operatorname{coth}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1936.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}\sqrt[4]{z^2-1}}{\sqrt{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4}\left(\sqrt{\frac{1}{1-z}}\sqrt{1-z}-\sqrt{z+1}\sqrt{\frac{1}{z+1}+1}\right) + \frac{1}{2}\sqrt{z^2}\sqrt{-\frac{1}{z^2}}\operatorname{coth}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}\sqrt{\sqrt{1-z^2}/(\sqrt{1-z^2}-1)}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}\sqrt{1-z^2}/(\sqrt{1-z^2}-1)\right)$ and $\operatorname{coth}^{-1}(z)$

01.17.27.1937.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{\pi}{4} - \frac{1}{2}i \operatorname{coth}^{-1}(z); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1938.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}i \operatorname{coth}^{-1}(z) + \frac{\pi}{4}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1939.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{\sqrt{-z-1}\sqrt{-z}}{2\sqrt{(1-z)z}}\sqrt{\frac{z-1}{z+1}}\operatorname{coth}^{-1}(z) + \frac{\pi}{4}$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}\sqrt{\sqrt{1-z^2}/(\sqrt{1-z^2}-1)}\right)$ and $\operatorname{coth}^{-1}\left(\frac{1}{z}\right)$

01.17.27.1940.01

$$\operatorname{csc}^{-1}\left(\sqrt{2}\sqrt{\frac{\sqrt{1-z^2}}{\sqrt{1-z^2}-1}}\right) = \frac{1}{2}i \operatorname{coth}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1941.01

$$\csc^{-1} \left(\sqrt{2} \frac{\sqrt{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = -\frac{i}{2} \coth^{-1} \left(\frac{1}{z} \right); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1942.01

$$\csc^{-1} \left(\sqrt{2} \frac{\sqrt{1-z^2}}{\sqrt{\sqrt{1-z^2}-1}} \right) = -\frac{1}{2} \sqrt{-\frac{1}{z^2}} z \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} \coth^{-1} \left(\frac{1}{z} \right)$$

Involving $\csc^{-1} \left(\sqrt{2 \sqrt{z^2-1}} / (\sqrt{z^2-1} - z) \right)$

Involving $\csc^{-1} \left(\sqrt{2 \sqrt{z^2-1}} / (\sqrt{z^2-1} - z) \right)$ and $\coth^{-1}(z)$

01.17.27.1943.01

$$\csc^{-1} \left(\sqrt{\frac{2 \sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) = \frac{i}{2} \coth^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1944.01

$$\csc^{-1} \left(\sqrt{\frac{2 \sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) = -\frac{i}{2} \coth^{-1}(z); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1945.01

$$\csc^{-1} \left(\sqrt{\frac{2 \sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) = \frac{\pi}{2} - \frac{i}{2} \coth^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1946.01

$$\csc^{-1} \left(\sqrt{\frac{2 \sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) = \frac{i}{2} \coth^{-1}(z) + \frac{\pi}{2}; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1947.01

$$\csc^{-1} \left(\sqrt{\frac{2 \sqrt{z^2-1}}{\sqrt{z^2-1}-z}} \right) = \frac{\pi}{4} \left(1 - \frac{\sqrt{z^2}}{z} \right) + \frac{1}{2} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \coth^{-1}(z)$$

Involving $\csc^{-1} \left(\sqrt{2 \sqrt{z^2-1}} / (\sqrt{z^2-1} - z) \right)$ and $\coth^{-1}(\frac{1}{z})$

01.17.27.1948.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}i \coth^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{4}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.1949.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} - \frac{1}{2}i \coth^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1950.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{1}{2}i \coth^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1951.01

$$\csc^{-1}\left(\sqrt{\frac{2\sqrt{z^2-1}}{\sqrt{z^2-1}-z}}\right) = \frac{\pi}{4} \left(2 - \sqrt{z+1} \sqrt{\frac{1}{z+1}}\right) + \frac{1}{2} \sqrt{\frac{1}{1-z}} \sqrt{1-z} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \coth^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{a z^c}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{a z^c}\right)$ and $\coth^{-1}\left(\frac{1}{a z^c}\right)$

01.17.27.1952.01

$$\csc^{-1}\left(\frac{\sqrt{a^2 z^{2c}-1}}{a z^c}\right) = \frac{1}{2}\pi \left(\sqrt{\frac{1}{a z^c+1}} \sqrt{a z^c+1} - \sqrt{\frac{1}{1-a z^c}} \sqrt{1-a z^c}\right) - \sqrt{\frac{1}{1-a^2 z^{2c}}} \sqrt{a^2 z^{2c}-1} \coth^{-1}\left(\frac{1}{a z^c}\right)$$

Involving csch^{-1}

Involving $\csc^{-1}(z)$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}(iz)$

01.17.27.0049.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}(iz)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{iz^2}{2-z^2}\right)$

01.17.27.1953.01

$$\csc^{-1}(z) = \frac{1}{2} \left(i \operatorname{csch}^{-1}\left(\frac{iz^2}{2-z^2}\right) + \frac{\pi}{2} \right); -\frac{\pi}{2} \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.1954.01

$$\csc^{-1}(z) = -\frac{1}{2} \left(i \operatorname{csch}^{-1} \left(\frac{i z^2}{2 - z^2} \right) + \frac{\pi}{2} \right); \frac{\pi}{2} \leq \arg(z) \leq \pi \vee -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.1955.01

$$\csc^{-1}(z) = \frac{1}{2} \sqrt{\frac{1}{z^2}} z \left(i \operatorname{csch}^{-1} \left(\frac{i z^2}{2 - z^2} \right) + \frac{\pi}{2} \right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\frac{i \sqrt{2z}}{\sqrt{z-1}} \right)$

01.17.27.1956.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1} \left(\frac{i \sqrt{2z}}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\frac{\sqrt{-2z}}{\sqrt{z-1}} \right)$

01.17.27.1957.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1} \left(\frac{\sqrt{-2z}}{\sqrt{z-1}} \right); -\pi < \arg(z) \leq 0$$

01.17.27.1958.01

$$\csc^{-1}(z) = 2i \operatorname{csch}^{-1} \left(\frac{\sqrt{-2z}}{\sqrt{z-1}} \right) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.1959.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{2\sqrt{-z^2}}{z} \operatorname{csch}^{-1} \left(\frac{\sqrt{-2z}}{\sqrt{z-1}} \right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{1-z}} \right)$

01.17.27.1960.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{1-z}} \right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1961.01

$$\csc^{-1}(z) = \frac{\pi}{2} + 2i \operatorname{csch}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{1-z}} \right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1962.01

$$\csc^{-1}(z) = \frac{\pi}{2} - \frac{2\sqrt{z-1}}{\sqrt{1-z}} \operatorname{csch}^{-1} \left(\frac{\sqrt{2z}}{\sqrt{1-z}} \right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$

01.17.27.1963.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.1964.01

$$\csc^{-1}(z) = 2i \operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.1965.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2\sqrt{\frac{1}{1-z}} \sqrt{z-1} \operatorname{csch}^{-1}\left(\sqrt{\frac{2z}{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-1-z}}\right)$

01.17.27.1966.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-1-z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.1967.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-1-z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.1968.01

$$\csc^{-1}(z) = -\frac{2\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{-1-z}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right)$

01.17.27.1969.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1970.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > -1)$$

01.17.27.1971.01

$$\csc^{-1}(z) = \frac{2\sqrt{-(z+1)^2}}{z+1} \operatorname{csch}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{z+1}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{z+1}}\right)$

01.17.27.1972.01

$$\csc^{-1}(z) = -\frac{\pi}{2} - 2i \operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{z+1}}\right) /; \operatorname{Im}(z) > 0$$

01.17.27.1973.01

$$\csc^{-1}(z) = -\frac{\pi}{2} + 2i \operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{z+1}}\right) /; \operatorname{Im}(z) \leq 0$$

01.17.27.1974.01

$$\csc^{-1}(z) = 2\sqrt{-z} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{-\frac{2z}{z+1}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$

01.17.27.1975.01

$$\csc^{-1}(z) = -i \operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) /; 0 < \arg(z) \leq \pi$$

01.17.27.1976.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\sqrt{-z^2}\right) /; -\pi < \arg(z) \leq 0$$

01.17.27.1977.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\sqrt{-z^2}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$

01.17.27.1978.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1979.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1980.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1981.01

$$\csc^{-1}(z) = -i \operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1982.01

$$\csc^{-1}(z) = \frac{\pi}{2} z \sqrt{\frac{1}{z^2}} - \frac{\sqrt{z^2} \sqrt{z^2-1}}{\sqrt{1-z^2}} \sqrt{\frac{1}{z^2}} \operatorname{csch}^{-1}\left(\frac{z}{\sqrt{1-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$

01.17.27.1983.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.1984.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.1985.01

$$\csc^{-1}(z) = -i \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.1986.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z < 0) \bigvee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.1987.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - \sqrt{-\frac{1}{z^4}} z \sqrt{\frac{z^2}{1-z^2}} \sqrt{1-z^2} \operatorname{csch}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$

01.17.27.1988.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) + \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1989.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) /; -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.1990.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.1991.01

$$\csc^{-1}(z) = -i \operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.1992.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - \frac{\sqrt{-z^4}}{z} \sqrt{\frac{1}{z^2}} \operatorname{csch}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$

01.17.27.1993.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.1994.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) + \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.1995.01

$$\csc^{-1}(z) = -i \operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.1996.01

$$\csc^{-1}(z) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < 0) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.1997.01

$$\csc^{-1}(z) = \frac{\pi z}{2} \sqrt{\frac{1}{z^2}} - \sqrt{-\frac{1}{z^4}} z \sqrt{z^2} \operatorname{csch}^{-1}\left(\sqrt{\frac{z^2}{1-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right)$

01.17.27.1998.01

$$\csc^{-1}(z) = -\frac{\sqrt{z^2} \sqrt{1-z^2}}{2z \sqrt{z^2-1}} \operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right); \frac{\pi}{4} \leq \arg(z) \leq \frac{3\pi}{4} \vee |z| \geq \sqrt{2}$$

01.17.27.1999.01

$$\csc^{-1}(z) = \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{\sqrt{\frac{1-z^2}{z^4}} z}{\sqrt{\frac{1-z^2}{z^2}}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{1-z^2}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \operatorname{csch}^{-1}\left(\frac{z^2}{2\sqrt{1-z^2}}\right) \right)$$

Involving $\csc^{-1}(iz)$

Involving $\csc^{-1}(iz)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.0050.01

$$\csc^{-1}(iz) = -i \operatorname{csch}^{-1}(z)$$

Involving $\csc^{-1}(\sqrt{cz})$

Involving $\csc^{-1}(\sqrt{z})$ and $\operatorname{csch}^{-1}(\sqrt{-z})$

01.17.27.2000.01

$$\csc^{-1}(\sqrt{z}) = -i \operatorname{csch}^{-1}(\sqrt{-z}); 0 < \arg(z) \leq \pi$$

01.17.27.2001.01

$$\csc^{-1}(\sqrt{z}) = i \operatorname{csch}^{-1}(\sqrt{-z}); -\pi < \arg(z) \leq 0$$

01.17.27.2002.01

$$\csc^{-1}(\sqrt{z}) = \frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}(\sqrt{-z})$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\operatorname{csch}^{-1}(\sqrt{z})$

01.17.27.2003.01

$$\csc^{-1}(\sqrt{-z}) = i \operatorname{csch}^{-1}(\sqrt{z}); 0 < \arg(z) \leq \pi$$

01.17.27.2004.01

$$\csc^{-1}(\sqrt{-z}) = -i \operatorname{csch}^{-1}(\sqrt{z}); -\pi < \arg(z) \leq 0$$

01.17.27.0052.01

$$\csc^{-1}(\sqrt{-z}) = \frac{\sqrt{z}}{\sqrt{-z}} \operatorname{csch}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-z}}\right)$

01.17.27.2005.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.2006.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2007.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = -\frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{-z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right)$

01.17.27.2008.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.2009.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = -i \operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right); \operatorname{Im}(z) < 0$$

01.17.27.2010.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \sqrt{z} \sqrt{-\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{-\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2011.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.2012.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2013.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z}}{\sqrt{z}} \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2014.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0$$

01.17.27.2015.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.2016.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \sqrt{-z} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{c z^2}\right)$

Involving $\csc^{-1}\left(\sqrt{z^2}\right)$ and $\operatorname{csch}^{-1}(i z)$

01.17.27.2017.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = i \operatorname{csch}^{-1}(i z); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2018.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = -i \operatorname{csch}^{-1}(i z); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2019.01

$$\csc^{-1}\left(\sqrt{z^2}\right) = \frac{i \sqrt{z^2}}{z} \operatorname{csch}^{-1}(i z)$$

Involving $\csc^{-1}\left(\sqrt{-z^2}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2020.01

$$\csc^{-1}\left(\sqrt{-z^2}\right) = i \operatorname{csch}^{-1}(z); 0 < \arg(z) \leq \pi$$

01.17.27.2021.01

$$\csc^{-1}\left(\sqrt{-z^2}\right) = -i \operatorname{csch}^{-1}(z); -\pi < \arg(z) \leq 0$$

01.17.27.2022.01

$$\csc^{-1}\left(\sqrt{-z^2}\right) = -\frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}(z)$$

Involving $\csc^{-1}\left(a\left(bz^c\right)^m\right)$

Involving $\csc^{-1}\left(a\left(bz^c\right)^m\right)$ and $\operatorname{csch}^{-1}\left(ab^m z^{mc}\right)$

01.17.27.2023.01

$$\csc^{-1}\left(a\left(bz^c\right)^m\right) = \frac{i\left(bz^c\right)^m}{b^m z^{mc}} \operatorname{csch}^{-1}\left(ab^m z^{mc}\right) ; 2m \in \mathbb{Z}$$

Involving $\csc^{-1}\left(\frac{1}{1+2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1+2z^2}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2024.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) ; -\pi < \arg(z) \leq 0$$

01.17.27.2025.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = 2i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} ; 0 < \arg(z) \leq \pi$$

01.17.27.2026.01

$$\csc^{-1}\left(\frac{1}{2z^2+1}\right) = \frac{\pi}{2} - \frac{2\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2+2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2+2}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2027.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = \frac{\pi}{2} - 2i \operatorname{csch}^{-1}(z) ; 0 \leq \arg(z) < \pi$$

01.17.27.2028.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = 2i \operatorname{csch}^{-1}(z) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.0051.01

$$\csc^{-1}\left(\frac{z^2}{z^2+2}\right) = \frac{\pi}{2} - 2z \sqrt{-\frac{1}{z^2}} \operatorname{csch}^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2029.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.2030.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2031.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2032.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0$$

01.17.27.2033.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.2034.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - \sqrt{-z} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2035.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2036.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) + \frac{\pi}{2} /; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2037.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = -i \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2038.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \operatorname{csch}^{-1}\left(\frac{1}{\sqrt{z}}\right) \right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2039.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) /; -\pi < \arg(z) \leq 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2040.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} /; 0 < \arg(z) < \pi$$

01.17.27.2041.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = i \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} /; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2042.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - \sqrt{-z} \sqrt{\frac{1}{z}} \operatorname{csch}^{-1}\left(\sqrt{\frac{1}{z}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.17.27.2043.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{\pi}{4} - \frac{1}{2} i \operatorname{csch}^{-1}\left(\frac{i}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.17.27.2044.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{i}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{4}$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.17.27.2045.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{\pi}{4} - \frac{i}{2} \operatorname{csch}^{-1}\left(\frac{i}{z}\right); z \notin (1, \infty)$$

01.17.27.2046.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{1}{2} i \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{4}; (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2047.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{\sqrt{1-z}}{2} \sqrt{\frac{1}{1-z}} \left(\frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{i}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{i}{z}\right)$

01.17.27.2048.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2} \left(\frac{\pi}{2} + i \operatorname{csch}^{-1}\left(\frac{i}{z}\right)\right); z \notin (-\infty, -1)$$

01.17.27.2049.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right) = -\frac{1}{2} i \operatorname{csch}^{-1}\left(\frac{i}{z}\right) - \frac{\pi}{4}; (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2050.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{\sqrt{z+1}}{2} \sqrt{\frac{1}{z+1}} \left(i \operatorname{csch}^{-1}\left(\frac{i}{z}\right) + \frac{\pi}{2}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+a}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z})$

01.17.27.2051.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(\sqrt{z}) ; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2052.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = i \operatorname{csch}^{-1}(\sqrt{z}) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0$$

01.17.27.2053.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = i \operatorname{csch}^{-1}(\sqrt{z}) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2054.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{1+z}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{\sqrt{-z-1} \sqrt{z}} \left(\frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \operatorname{csch}^{-1}(\sqrt{z}) \right)$$

01.17.27.0056.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{\sqrt{-z-1} \sqrt{z}} \left(\frac{\pi}{2} - \sqrt{-\frac{1}{z}} \sqrt{z} \operatorname{csch}^{-1}(\sqrt{z}) \right)$$

01.17.27.0057.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{\pi}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{z}{z+1} \sqrt{-\frac{(z+1)^2}{z^2}} \operatorname{csch}^{-1}(\sqrt{z})$$

01.17.27.0055.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{a+z}}\right) = \frac{\sqrt{a+z}}{\sqrt{\frac{a}{z}+1} \sqrt{z}} \left(\frac{\pi}{2} - \sqrt{-\frac{a}{z}} \sqrt{\frac{z}{a}} \operatorname{csch}^{-1}\left(\sqrt{\frac{z}{a}}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z})$

01.17.27.2055.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(\sqrt{z}) ; \operatorname{Im}(z) \geq 0$$

01.17.27.2056.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} + i \operatorname{csch}^{-1}(\sqrt{z}) ; \operatorname{Im}(z) < 0$$

01.17.27.2057.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{-1-z}}\right) = \frac{\pi}{2} - \sqrt{-\frac{1}{z}} \sqrt{z} \operatorname{csch}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{1+z}}\right)$ and $\operatorname{csch}^{-1}(\sqrt{z})$

01.17.27.2058.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = -i \operatorname{csch}^{-1}(\sqrt{z}) + \frac{\pi}{2}; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2059.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = i \operatorname{csch}^{-1}(\sqrt{z}) + \frac{\pi}{2}; \operatorname{Im}(z) < 0$$

01.17.27.2060.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = i \operatorname{csch}^{-1}(\sqrt{z}) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2061.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \sqrt{\frac{z}{1+z}} \sqrt{\frac{1+z}{z}} \left(\frac{\pi}{2} - \sqrt{z} \sqrt{-\frac{1}{z}} \operatorname{csch}^{-1}(\sqrt{z}) \right)$$

01.17.27.0058.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \frac{\pi}{2} \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{z}{z+1} \sqrt{-\frac{(z+1)^2}{z^2}} \operatorname{csch}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2062.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2063.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; 0 < \arg(z) \leq \pi$$

01.17.27.2064.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{z}{\sqrt{-z^2}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2065.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) \leq 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.2066.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) \leq \pi \vee (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.2067.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2068.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = -i \operatorname{csch}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}; (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.2069.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1+z^2}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{z}{\sqrt{-z^2}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2} \right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2070.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(z); 0 \leq \arg(z) < \frac{\pi}{2} \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.2071.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \operatorname{csch}^{-1}(z) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.2072.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \operatorname{csch}^{-1}(z) - \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \bigvee (-i z \in \mathbb{R} \wedge 0 < -i z < 1)$$

01.17.27.2073.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -i \operatorname{csch}^{-1}(z) - \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0) \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2074.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi \sqrt{z^2}}{2z} - \sqrt{-\frac{1}{z^2}} \sqrt{z^2} \operatorname{csch}^{-1}(z) /; i z \notin (-1, 1)$$

01.17.27.0054.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2+1}}{z^2 \sqrt{-\frac{z^2+1}{z^4}}} \left(\frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} + \operatorname{csch}^{-1}(z) \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2075.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(z) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee \frac{\pi}{2} < \arg(z) < \pi \bigvee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.2076.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = i \operatorname{csch}^{-1}(z) + \frac{\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \wedge i z > 1) \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2077.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = i \operatorname{csch}^{-1}(z) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.2078.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{1+z^2}}\right) = -i \operatorname{csch}^{-1}(z) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.2079.01

$$\csc^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) = \frac{\sqrt{-z^2(z^2+1)}}{\sqrt{z^2}\sqrt{-z^2-1}} \left(\frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \operatorname{csch}^{-1}(z)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2080.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(z) ; 0 \leq \arg(z) < \pi$$

01.17.27.2081.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = i \operatorname{csch}^{-1}(z) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2082.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \sqrt{-\frac{1}{z^2}} z \operatorname{csch}^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2083.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{csch}^{-1}(z) ; 0 \leq \arg(z) < \frac{\pi}{2} \vee \frac{\pi}{2} < \arg(z) < \pi \vee (i z \in \mathbb{R} \wedge i z < -1)$$

01.17.27.2084.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \operatorname{csch}^{-1}(z) + \frac{\pi}{2} ; -\pi < \arg(z) < -\frac{\pi}{2} \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2085.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \operatorname{csch}^{-1}(z) - \frac{\pi}{2} ; (i z \in \mathbb{R} \wedge -1 < i z < 0)$$

01.17.27.2086.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -i \operatorname{csch}^{-1}(z) - \frac{\pi}{2}; \quad (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.2087.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -z \sqrt{\frac{z^2}{z^2+1}} \sqrt{-\frac{z^2+1}{z^4}} \left(\operatorname{csch}^{-1}(z) + \frac{\pi z}{2} \sqrt{-\frac{1}{z^2}} \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2088.01

$$\operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-z^2-1}}\right) = \frac{2\sqrt{-z^4}}{z^2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \quad |\arg(z)| \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq |\arg(z)| \leq \pi$$

01.17.27.2089.01

$$\begin{aligned} \operatorname{csc}^{-1}\left(\frac{1}{2z\sqrt{-1-z^2}}\right) &= \frac{\pi\sqrt{2z^2+1}\sqrt{z^4+z^2}}{2\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{z^2+1}} \left(-\frac{\sqrt{-z^2}}{z} - i\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{1}{1-i\sqrt{2}z}}\sqrt{1-i\sqrt{2}z} + \right. \\ &\quad \left. i\sqrt{-\frac{i}{z}}\sqrt{iz}\sqrt{\frac{1}{\sqrt{2}iz+1}}\sqrt{\sqrt{2}iz+1} - \frac{\sqrt{z^4+z^2}}{z\sqrt{-z^2-1}} \right) - \frac{2\sqrt{2z^2+1}\sqrt{z^4+z^2}}{\sqrt{z^2}\sqrt{-2z^2-1}\sqrt{z^2+1}} \operatorname{csch}^{-1}\left(\frac{1}{z}\right) \end{aligned}$$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-1-z^2}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2090.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right) = \frac{2\sqrt{-z^2}}{z} \operatorname{csch}^{-1}(z); \quad |\arg(z)| \leq \frac{\pi}{4} \vee \frac{3\pi}{4} \leq |\arg(z)| \leq \pi \vee |z| \geq \sqrt{2}$$

01.17.27.2091.01

$$\operatorname{csc}^{-1}\left(\frac{z^2}{2\sqrt{-z^2-1}}\right) = \frac{z^3\sqrt{-z^2-2}\sqrt{-z^2-1}}{2\sqrt{1-iz}(iz+1)\sqrt{-z^4-3z^2-2}}\sqrt{\frac{z^2+1}{z^4}}\sqrt{\frac{i-z}{z}}\sqrt{\frac{-i}{z}}\left(\pi\left(-\frac{z^3}{z^2+1}\sqrt{-\frac{z^2+1}{z^2}}\sqrt{\frac{z^2+1}{z^4}}+\sqrt{-\frac{1}{z^2}}z+i\sqrt{\frac{z-i\sqrt{2}}{z}}\sqrt{\frac{-i}{z}}\sqrt{iz}\sqrt{\frac{z}{-i\sqrt{2}+z}}-i\sqrt{\frac{z+i\sqrt{2}}{z}}\sqrt{\frac{i}{z}}\sqrt{-iz}\sqrt{\frac{z}{i\sqrt{2}+z}}\right)+4\operatorname{csch}^{-1}(z)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1+z^2}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\sqrt{1-\sqrt{1+z^2}}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2092.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = \frac{i}{2}\operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2093.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \pi$$

01.17.27.2094.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{z^2+1}}}\right) = \frac{\sqrt{-z^2}}{2z}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2}/\left(1-\sqrt{1+z^2}\right)\right)$

Involving $\csc^{-1}\left(\sqrt{2/\left(1-\sqrt{1+z^2}\right)}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2095.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 \leq \arg(z) < \pi$$

01.17.27.2096.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2097.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}\sqrt{-\frac{1}{z^2}} z \operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1+z^2}}\right)\right)$

Involving $\csc^{-1}\left(\sqrt{2z^2}/\left(z\sqrt{1-\sqrt{1+z^2}}\right)\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2098.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{1}{2}i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.2099.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2}i \operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2100.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1+z^2}}}\right) = \frac{\sqrt{-z^4}}{2z^2} \operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1+z^2})}\right)$

Involving $\csc^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1+z^2})}\right)$ and $\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2101.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = \frac{1}{2}i\operatorname{csch}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.2102.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\operatorname{csch}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee \operatorname{Im}(z) = 0 \vee (iz \in \mathbb{R} \wedge -1 < iz < 1)$$

01.17.27.2103.01

$$\csc^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{z^2+1}}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{-z^2}\sqrt{\frac{i+z}{i-z}}\sqrt{\frac{i-z}{i+z}}\operatorname{csch}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2104.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i\operatorname{csch}^{-1}(z); 0 < \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.2105.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i\operatorname{csch}^{-1}(z); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.2106.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{\pi}{2} - \frac{1}{2}i \operatorname{csch}^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \bigvee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.2107.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \operatorname{csch}^{-1}(z) + \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz > 1) \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2108.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2+1}}}\right) = \frac{z^2}{2} \sqrt{-\frac{1}{z^4}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \operatorname{csch}^{-1}(z) + \frac{1}{4}\pi \left(1 - z \sqrt{\frac{1}{z^2}} \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{1+z^2})}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{1+z^2})}\right)$ and $\operatorname{csch}^{-1}(z)$

01.17.27.2109.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \operatorname{csch}^{-1}(z); 0 < \arg(z) < \frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.2110.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = -\frac{1}{2}i \operatorname{csch}^{-1}(z); -\frac{\pi}{2} < \arg(z) \leq 0 \bigvee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.2111.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{\pi}{2} - \frac{1}{2}i \operatorname{csch}^{-1}(z); \frac{\pi}{2} < \arg(z) < \pi \bigvee (-iz \in \mathbb{R} \wedge 0 < -iz < 1)$$

01.17.27.2112.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}i \operatorname{csch}^{-1}(z) + \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (iz \in \mathbb{R} \wedge iz > 1) \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2113.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2+1}}}\right) = \frac{1}{2}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{z}}(-z)^{3/2}\sqrt{\frac{1}{1+z^2}}\sqrt{1+z^2}\operatorname{csch}^{-1}(z) + \frac{1}{4}\pi\left(1-z\sqrt{\frac{1}{z^2}}\sqrt{\frac{1}{z^2+1}}\sqrt{z^2+1}\right)$$

Involving sech^{-1}

Involving $\operatorname{csc}^{-1}(z)$

Involving $\operatorname{csc}^{-1}(z)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2114.01

$$\operatorname{csc}^{-1}(z) = i \operatorname{sech}^{-1}(z) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2115.01

$$\operatorname{csc}^{-1}(z) = -i \operatorname{sech}^{-1}(z) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.0059.01

$$\operatorname{csc}^{-1}(z) = \frac{\pi}{2} - \frac{\sqrt{1-\frac{1}{z}}}{\sqrt{\frac{1}{z}-1}} \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}(z)$ and $\operatorname{sech}^{-1}(-z)$

01.17.27.2116.01

$$\operatorname{csc}^{-1}(z) = i \operatorname{sech}^{-1}(-z) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2117.01

$$\operatorname{csc}^{-1}(z) = -i \operatorname{sech}^{-1}(-z) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 0)$$

01.17.27.2118.01

$$\operatorname{csc}^{-1}(z) = \frac{\sqrt{1+\frac{1}{z}}}{\sqrt{-1-\frac{1}{z}}} \operatorname{sech}^{-1}(-z) - \frac{\pi}{2}$$

Involving $\operatorname{csc}^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2-2}\right)$

01.17.27.2119.01

$$\operatorname{csc}^{-1}(z) = -\frac{1}{2}i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2-2}\right); 0 \leq \arg(z) < \pi$$

01.17.27.2120.01

$$\csc^{-1}(z) = \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2-2}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2121.01

$$\csc^{-1}(z) = -\frac{1}{2} \sqrt{-\frac{1}{z^2}} z \operatorname{sech}^{-1}\left(\frac{z^2}{z^2-2}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right)$

01.17.27.2122.01

$$\csc^{-1}(z) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right) + \frac{\pi}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2123.01

$$\csc^{-1}(z) = \frac{i}{2} \operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right) + \frac{\pi}{2}; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2124.01

$$\csc^{-1}(z) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2125.01

$$\csc^{-1}(z) = \frac{i}{2} \operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right) - \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2126.01

$$\csc^{-1}(z) = \frac{1}{2} z \sqrt{\frac{1}{z^2}} \pi - \frac{z \sqrt{1-z}}{2} \sqrt{-1 - \frac{1}{z}} \sqrt{\frac{1}{1-z^2}} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{z^2}{2-z^2}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$

01.17.27.2127.01

$$\csc^{-1}(z) = -2 i \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}; 0 \leq \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2128.01

$$\csc^{-1}(z) = 2 i \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2129.01

$$\csc^{-1}(z) = -2 \sqrt{\frac{z-1}{z^2}} z \sqrt{\frac{1}{z+1}} \sqrt{\frac{z+1}{1-z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) - \frac{\pi}{2}$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$

01.17.27.2130.01

$$\csc^{-1}(z) = -2i \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) - \frac{\pi}{2}; 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2131.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2132.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2133.01

$$\csc^{-1}(z) = \left(\frac{1}{2} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}}\right)\pi - 2\sqrt{\frac{z-1}{z^2}} z \sqrt{\frac{1}{z+1}} \sqrt{\frac{z+1}{1-z}} \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$

01.17.27.2134.01

$$\csc^{-1}(z) = -2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2135.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) - \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2136.01

$$\csc^{-1}(z) = \frac{3\pi}{2} - 2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z-1}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2137.01

$$\csc^{-1}(z) = -\frac{\pi}{2} \left(2\sqrt{-z} \sqrt{-\frac{1}{z}} \sqrt{1-z} \sqrt{\frac{1}{1-z}} - 1\right) - 2\sqrt{\frac{z+1}{1-z}} z \sqrt{\frac{z-1}{z^2}} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$

01.17.27.2138.01

$$\csc^{-1}(z) = -2i \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2139.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2140.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2141.01

$$\csc^{-1}(z) = \left(\sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{1}{2}\right)\pi - 2\sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \operatorname{sech}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right)$

01.17.27.2142.01

$$\csc^{-1}(z) = -2i \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2143.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2144.01

$$\csc^{-1}(z) = \frac{\pi}{2} - 2\sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \operatorname{sech}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$

01.17.27.2145.01

$$\csc^{-1}(z) = -2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2146.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) + \frac{\pi}{2}; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2147.01

$$\csc^{-1}(z) = 2i \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) - \frac{3\pi}{2}; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2148.01

$$\csc^{-1}(z) = \left(\sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}} - \frac{1}{2}\right)\pi - 2\sqrt{\frac{-z-1}{z^2}} z \sqrt{\frac{1}{1-z}} \sqrt{\frac{1-z}{z+1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{z^2}\right)$

01.17.27.2149.01

$$\csc^{-1}(z) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\sqrt{z^2}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2150.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\sqrt{z^2}\right) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2151.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1}\left(\sqrt{z^2}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2152.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\sqrt{z^2}\right) - \frac{\pi}{2}; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2153.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{z} \sqrt{\frac{z+1}{z-1}} \sqrt{\frac{z-1}{z+1}} \operatorname{sech}^{-1}\left(\sqrt{z^2}\right) + \frac{\pi \sqrt{z^2}}{2z}$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$

01.17.27.2154.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right); 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2155.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right); -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.2156.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) - \pi; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2157.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) - \pi; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2158.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) + \pi; (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.2159.01

$$\csc^{-1}(z) = \frac{1}{2} \left(-2 \sqrt{\frac{i}{z}} \sqrt{-iz} + \frac{\sqrt{z^2}}{z} + 1 \right) \pi - z \sqrt{-\frac{1}{z^2}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \operatorname{sech}^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$

01.17.27.2160.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right); 0 \leq \arg(z) < \pi$$

01.17.27.2161.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2162.01

$$\csc^{-1}(z) = -z \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$

01.17.27.2163.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2164.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2165.01

$$\csc^{-1}(z) = \pi - i \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right); (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2166.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) - \pi; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2167.01

$$\csc^{-1}(z) = \frac{\pi}{2} \left(\sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} - \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \right) - z \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$

01.17.27.2168.01

$$\csc^{-1}(z) = -i \operatorname{sech}^{-1} \left(\sqrt{\frac{z^2}{z^2 - 1}} \right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2169.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1} \left(\sqrt{\frac{z^2}{z^2 - 1}} \right) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2170.01

$$\csc^{-1}(z) = i \operatorname{sech}^{-1} \left(\sqrt{\frac{z^2}{z^2 - 1}} \right) - \pi ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2171.01

$$\csc^{-1}(z) = \pi - i \operatorname{sech}^{-1} \left(\sqrt{\frac{z^2}{z^2 - 1}} \right) ; (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2172.01

$$\csc^{-1}(z) = -\frac{\pi}{2} \left(\sqrt{\frac{1}{z-1}} \sqrt{z-1} \sqrt{\frac{1}{z}} \sqrt{z} - \sqrt{-z-1} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{-\frac{1}{z+1}} \right) - z \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1} \left(\sqrt{\frac{z^2}{z^2 - 1}} \right)$$

Involving $\csc^{-1}(z)$ and $\operatorname{sech}^{-1} \left(\frac{z^2}{2\sqrt{z^2-1}} \right)$

01.17.27.2173.01

$$\csc^{-1}(z) = \frac{\sqrt{-z^2}}{2z} \operatorname{sech}^{-1} \left(\frac{z^2}{2\sqrt{z^2-1}} \right) + \frac{\pi\sqrt{z^2}}{4z} ; z \notin (-1, 1)$$

01.17.27.2174.01

$$\csc^{-1}(z) = \frac{\pi}{4} \sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{z^2}{z^2-2}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \frac{z\sqrt{z^2-2}}{2\sqrt{z^2(2-z^2)}} \operatorname{sech}^{-1} \left(\frac{z^2}{2\sqrt{z^2-1}} \right)$$

01.17.27.2175.01

$$\begin{aligned} \csc^{-1}(z) = & \frac{1}{4} \left(\pi \left(\sqrt{\frac{1}{z^2}} z + \frac{\sqrt{\frac{1-z^2}{z^4}} z}{\sqrt{\frac{1-z^2}{z^2}}} - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{\frac{z-\sqrt{2}}{z}} \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} \right) - \right. \\ & \frac{2z}{\sqrt{\frac{z^2-2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{z^2-1}} \sqrt{\frac{2-z^2}{z^2}} \sqrt{-\frac{1}{z^2}} \sqrt{-\frac{(z^2-1)^2}{z^4}} \\ & \left. \left(\frac{\pi}{2} - \frac{1}{\sqrt{\frac{2\sqrt{z^2-1}}{z^2} - 1}} \sqrt{1 - \frac{2\sqrt{z^2-1}}{z^2}} \operatorname{sech}^{-1} \left(\frac{z^2}{2\sqrt{z^2-1}} \right) \right) \right) \end{aligned}$$

Involving $\csc^{-1}(\sqrt{cz})$

Involving $\csc^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}(\sqrt{z})$

01.17.27.2176.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - i \operatorname{sech}^{-1}(\sqrt{z}) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.2177.01

$$\csc^{-1}(\sqrt{z}) = i \operatorname{sech}^{-1}(\sqrt{z}) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2178.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}(\sqrt{z})$ and $\operatorname{sech}^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$

01.17.27.2179.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(1/\sqrt{\frac{1}{z}}\right) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2180.01

$$\csc^{-1}(\sqrt{z}) = i \operatorname{sech}^{-1}\left(1/\sqrt{\frac{1}{z}}\right) + \frac{\pi}{2} ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2181.01

$$\csc^{-1}(\sqrt{z}) = -i \operatorname{sech}^{-1}\left(1/\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2} ; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2182.01

$$\csc^{-1}(\sqrt{z}) = \frac{\pi}{2} \sqrt{z} \sqrt{\frac{1}{z} - \frac{\sqrt{z-1}}{\sqrt{1-z}}} \operatorname{sech}^{-1}\left(1/\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$

01.17.27.2183.01

$$\csc^{-1}(\sqrt{-z}) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right); \operatorname{Im}(z) > 0$$

01.17.27.2184.01

$$\csc^{-1}(\sqrt{-z}) = -i \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 0) \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2185.01

$$\csc^{-1}(\sqrt{-z}) = \pi - i \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2186.01

$$\csc^{-1}(\sqrt{-z}) = \frac{\pi}{2} \left(1 - \sqrt{\frac{z}{z+1}} \sqrt{\frac{z+1}{z}}\right) - \sqrt{-z} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$$

Involving $\csc^{-1}(\sqrt{-z})$ and $\operatorname{sech}^{-1}\left(\frac{z}{z+2}\right)$

01.17.27.2187.01

$$\csc^{-1}(\sqrt{-z}) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{z}{z+2}\right); \operatorname{Im}(z) \leq 0$$

01.17.27.2188.01

$$\csc^{-1}(\sqrt{-z}) = \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{z}{z+2}\right); 0 < \arg(z) < \pi$$

01.17.27.2189.01

$$\csc^{-1}(\sqrt{-z}) = -\frac{\sqrt{-z}}{2} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{z}{z+2}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2190.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2191.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} + i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.2192.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2193.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2194.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} + i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2195.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right) - \frac{\pi}{2}; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2196.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z}}\right) = \frac{\pi}{2} \sqrt{\frac{1}{z}} \sqrt{z} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$

01.17.27.2197.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2198.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right); 0 < \arg(z) \leq \pi$$

01.17.27.2199.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2}}{z} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{1+2z}\right)$

01.17.27.2200.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{1+2z}\right); -\pi < \arg(z) \leq 0$$

01.17.27.2201.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{1+2z}\right); 0 < \arg(z) \leq \pi$$

01.17.27.2202.01

$$\csc^{-1}\left(\frac{1}{\sqrt{-z}}\right) = \frac{\sqrt{-z^2}}{2z} \operatorname{sech}^{-1}\left(\frac{1}{1+2z}\right)$$

Involving $\csc^{-1}(\sqrt{z^2})$

Involving $\csc^{-1}(\sqrt{z^2})$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2203.01

$$\csc^{-1}(\sqrt{z^2}) = \frac{\pi}{2} - i \operatorname{sech}^{-1}(z); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2204.01

$$\csc^{-1}(\sqrt{z^2}) = i \operatorname{sech}^{-1}(z) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2205.01

$$\csc^{-1}(\sqrt{z^2}) = i \operatorname{sech}^{-1}(z) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.2206.01

$$\csc^{-1}(\sqrt{z^2}) = -i \operatorname{sech}^{-1}(z) - \frac{\pi}{2}; -\pi < \arg(z) \leq -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2207.01

$$\csc^{-1}(\sqrt{z^2}) = \frac{\sqrt{z^2}}{z} \left(\frac{\pi}{2} - \frac{1}{\sqrt{\frac{1}{z} - 1}} \sqrt{1 - \frac{1}{z}} \operatorname{sech}^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$

Involving $\csc^{-1}\left(\frac{1}{1-2z^2}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2208.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = -\frac{\pi}{2} - 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2209.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2} /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2210.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{3\pi}{2} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.2211.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \frac{3\pi}{2} - 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2212.01

$$\csc^{-1}\left(\frac{1}{1-2z^2}\right) = \pi \left(\frac{1}{2} - \frac{\sqrt{z^2}}{z} \right) + \frac{2\sqrt{1-z}\sqrt{z^2}}{\sqrt{z-1}z} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{z^2-2}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2213.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = 2i \operatorname{sech}^{-1}(z) - \frac{\pi}{2} /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2214.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = -2i \operatorname{sech}^{-1}(z) - \frac{\pi}{2} /; -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2215.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \frac{3\pi}{2} - 2i \operatorname{sech}^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.2216.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = 2i \operatorname{sech}^{-1}(z) + \frac{3\pi}{2} /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2217.01

$$\csc^{-1}\left(\frac{z^2}{z^2-2}\right) = \pi \left(\frac{1}{2} - \sqrt{\frac{1}{z^2}} z \right) + \frac{2z}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2218.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2219.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2220.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2221.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = -i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2222.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2223.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \pi - i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2224.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z}\right) \sqrt{\frac{1}{z}} + \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$

01.17.27.2225.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z+1}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$

01.17.27.2226.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.2227.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right); \operatorname{Im}(z) < 0$$

01.17.27.2228.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -\sqrt{\frac{1}{1-z}} \sqrt{-1+z} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$

01.17.27.2229.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = -i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); 0 \leq \arg(z) < \pi$$

01.17.27.2230.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); \operatorname{Im}(z) < 0$$

01.17.27.2231.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \pi - i \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right); (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2232.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) - \sqrt{\frac{1}{1-z}} \sqrt{-1+z} \operatorname{sech}^{-1}\left(\sqrt{\frac{1}{z}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{1+z}}\right)$

01.17.27.2233.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z+1}}\right) = \sqrt{z+1} \sqrt{\frac{1}{z+1}} \left(\frac{\pi}{2} - \frac{\sqrt{-z^2}}{z} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z+1}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+cz}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1+z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2234.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(\pi - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2235.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(\pi + i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.2236.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{z+1}}\right) = \frac{1}{2}\left(\pi - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2237.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = \frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2238.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge z < 1)$$

01.17.27.2239.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-z}}\right) = -\frac{\sqrt{z} \sqrt{1-z}}{2} \sqrt{\frac{1}{1-z}} \sqrt{-\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+cz}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1+z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2240.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2}\left(\pi - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2241.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi\right); \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge -1 < z < 1)$$

01.17.27.2242.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = -\frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \pi\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2243.01

$$\csc^{-1}\left(\sqrt{\frac{2}{z+1}}\right) = \frac{\sqrt{z+1}}{2} \sqrt{\frac{1}{z+1}} \left(\pi - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2244.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) \geq 0$$

01.17.27.2245.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = \frac{i}{2} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \operatorname{Im}(z) < 0$$

01.17.27.2246.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-z}}\right) = -\frac{1}{2} \sqrt{z} \sqrt{-\frac{1}{z}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{z})$

01.17.27.2247.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = i \operatorname{sech}^{-1}(\sqrt{z}); 0 < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2248.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = -i \operatorname{sech}^{-1}(\sqrt{z}); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2249.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(\sqrt{z}); |\arg(z)| < \pi$$

01.17.27.2250.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z}} \sqrt{z}\right) + \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z}{z+2}\right)$

01.17.27.2251.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{\sqrt{-z} \sqrt{z+1}}{2\sqrt{-z-1} \sqrt{z}} \left(\pi - z \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\frac{z}{z+2}\right) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$

01.17.27.2252.01

$$\csc^{-1}\left(\frac{\sqrt{z}}{\sqrt{z+1}}\right) = \frac{1}{2}\pi \left(\sqrt{1+\frac{1}{z}} \sqrt{\frac{z}{z+1}} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{z+1}} \sqrt{z+1} + 1 \right) - z \sqrt{-\frac{1}{z^2}} \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{z})$

01.17.27.2253.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = i \operatorname{sech}^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0$$

01.17.27.2254.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = -i \operatorname{sech}^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.17.27.2255.01

$$\csc^{-1}\left(\frac{\sqrt{-z}}{\sqrt{1-z}}\right) = \frac{1}{2} \sqrt{\frac{z-1}{z}} \sqrt{\frac{z}{z-1}} \left(\frac{2\sqrt{z-1} \sqrt{z}}{\sqrt{1-z}} \sqrt{\frac{1}{z}} \operatorname{sech}^{-1}(\sqrt{z}) - \pi \sqrt{\frac{1}{z}} \sqrt{z} + \pi \right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right)$ and $\operatorname{sech}^{-1}(\sqrt{z})$

01.17.27.2256.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = i \operatorname{sech}^{-1}(\sqrt{z}) /; \operatorname{Im}(z) > 0$$

01.17.27.2257.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = -i \operatorname{sech}^{-1}(\sqrt{z}) /; -\pi < \arg(z) \leq 0$$

01.17.27.2258.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \pi - i \operatorname{sech}^{-1}(\sqrt{z}) ; (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2259.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(\sqrt{z}) ; z \notin (-\infty, 1)$$

01.17.27.0060.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z-1}}\right) = \frac{\pi}{2} \left(1 - \sqrt{z} \sqrt{\frac{1}{z}}\right) - \sqrt{\frac{z}{z-1}} \sqrt{\frac{1-z}{z}} \operatorname{sech}^{-1}(\sqrt{z})$$

Involving $\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$

01.17.27.2260.01

$$\csc^{-1}\left(\sqrt{\frac{z}{z+1}}\right) = \frac{\pi}{2} - \sqrt{\frac{z+1}{z}} \sqrt{\frac{z}{z+1}} z \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z}{z+1}}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+a}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2261.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{1}{2} i \operatorname{sech}^{-1}(z) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2262.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = -\frac{i}{2} \operatorname{sech}^{-1}(z) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2263.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-1}}\right) = \frac{z \sqrt{1-z}}{2} \sqrt{\frac{1}{1-z}} \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2264.01

$$\csc^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} (\pi - i \operatorname{sech}^{-1}(z)) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2265.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} (i \operatorname{sech}^{-1}(z) + \pi) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2266.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{1}{2} \left(\pi - \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(z) \right) ; |\arg(z)| < \pi$$

01.17.27.2267.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z+1}}\right) = \frac{\pi(\sqrt{-z-1} \sqrt{z})}{2(\sqrt{-z} \sqrt{z+1})} - \frac{\sqrt{-z-1} \sqrt{z-1}}{2\sqrt{\frac{1-z}{z} \sqrt{-z(z+1)}}} \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{a-z}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2268.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2} (\pi - i \operatorname{sech}^{-1}(z)) ; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2269.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-1-z}}\right) = \frac{1}{2} (\pi + i \operatorname{sech}^{-1}(z)) ; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1) \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2270.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{-z-1}}\right) = \frac{1}{2} \left(\pi - \frac{1}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \operatorname{sech}^{-1}(z) \right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2271.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2} i \operatorname{sech}^{-1}(z) ; \operatorname{Im}(z) \leq 0$$

01.17.27.2272.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = \frac{1}{2} i \operatorname{sech}^{-1}(z) ; \operatorname{Im}(z) > 0$$

01.17.27.2273.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{-2z}}{\sqrt{1-z}}\right) = -\frac{1}{2} \sqrt{\frac{1}{z}} \sqrt{-z} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+a}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2274.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}(\pi - i \operatorname{sech}^{-1}(z)) /; \operatorname{Im}(z) > 0 \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2275.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}(i \operatorname{sech}^{-1}(z) + \pi) /; \operatorname{Im}(z) < 0 \vee (z \in \mathbb{R} \wedge z < -1) \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2276.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = -\frac{1}{2}(i \operatorname{sech}^{-1}(z) + \pi) /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2277.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{1}{2}\left(\pi - \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(z)\right) /; |\arg(z)| < \pi$$

01.17.27.2278.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z+1}}\right) = \frac{\pi(\sqrt{-z-1} \sqrt{z})}{2(\sqrt{-z} \sqrt{z+1})} - \frac{\sqrt{-z-1} \sqrt{z-1}}{2\sqrt{\frac{1-z}{z}} \sqrt{-z(z+1)}} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2279.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = \frac{1}{2}i \operatorname{sech}^{-1}(z) /; \operatorname{Im}(z) > 0$$

01.17.27.2280.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2}i \operatorname{sech}^{-1}(z) /; \operatorname{Im}(z) \leq 0$$

01.17.27.2281.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-1}}\right) = -\frac{1}{2}\sqrt{\frac{1}{z}} \sqrt{-z} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1+cz^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2282.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2283.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2284.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi + i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.2285.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \pi - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2286.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2287.01

$$\csc^{-1}\left(\frac{1}{\sqrt{1-z^2}}\right) = \frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right) + \frac{\sqrt{1-z} \sqrt{z^2}}{\sqrt{z-1} z} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{2z^2+1}\right)$

01.17.27.2288.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{1}{2z^2+1}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.2289.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{1}{2z^2+1}\right) + \frac{\pi}{2}; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2290.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^4}}{2z^2} \operatorname{sech}^{-1}\left(\frac{1}{2z^2+1}\right)$$

Involving $\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$

01.17.27.2291.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) /; \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.2292.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) + \frac{\pi}{2} /; 0 < \arg(z) \leq \frac{\pi}{2} \vee -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2293.01

$$\csc^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - \frac{\sqrt{-z^4}}{z^2} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1+cz^2}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2294.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; 0 \leq \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2295.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{\pi}{2} < \arg(z) < 0$$

01.17.27.2296.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi + i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{2} < \arg(z) < \pi \vee (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2297.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \pi - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2298.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = -\pi - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right); (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2299.01

$$\csc^{-1}\left(\sqrt{\frac{1}{1-z^2}}\right) = \frac{\pi}{2} \left(1 - \frac{\sqrt{z^2}}{z}\right) \sqrt{\frac{1}{1-z^2}} \sqrt{1-z^2} - \sqrt{z} \sqrt{\frac{1}{z}} \sqrt{z+1} \sqrt{\frac{1}{z+1}} \sqrt{z^2} \sqrt{-\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right)$

01.17.27.2300.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{\pi}{2} - \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.2301.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right) + \frac{\pi}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge -1 < iz < 1)$$

01.17.27.2302.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = -\frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right) - \frac{\pi}{2}; (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.2303.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\pi}{2} - \frac{\sqrt{-z^4}}{2z^2} \operatorname{sech}^{-1}\left(\frac{1}{1+2z^2}\right)\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)$

01.17.27.2304.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right); \frac{\pi}{2} < \arg(z) \leq \pi \vee -\frac{\pi}{2} < \arg(z) \leq 0$$

01.17.27.2305.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) + \frac{\pi}{2}; 0 < \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge -1 < iz < 1)$$

01.17.27.2306.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = -i \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right) - \frac{\pi}{2}; (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.2307.01

$$\csc^{-1}\left(\sqrt{\frac{1}{z^2+1}}\right) = \sqrt{\frac{1}{z^2+1}} \sqrt{z^2+1} \left(\frac{\pi}{2} - \frac{\sqrt{-z^4}}{z^2} \operatorname{sech}^{-1}\left(\frac{1}{\sqrt{z^2+1}}\right)\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+a}}\right)$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2308.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \operatorname{sech}^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee (i z \in \mathbb{R} \wedge i z > 0)$$

01.17.27.2309.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2310.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = i \operatorname{sech}^{-1}(z) - \pi /; \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.2311.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = -i \operatorname{sech}^{-1}(z) - \pi /; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2312.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \pi - i \operatorname{sech}^{-1}(z) /; (i z \in \mathbb{R} \wedge i z < 0)$$

01.17.27.2313.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - 1\right) + \frac{\sqrt{z-1}}{\sqrt{1-z}} \operatorname{sech}^{-1}(z) /; \operatorname{Re}(z) \neq 0 \wedge |\arg(z)| < \pi$$

01.17.27.2314.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2-1}}\right) = \frac{\pi}{2} \left(\frac{\sqrt{z^2}}{z} - \sqrt{z^2} \sqrt{\frac{1}{z^2}}\right) + \frac{\sqrt{z^2}}{\sqrt{\frac{1-z}{z}}} \sqrt{\frac{z-1}{z}} \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.17.27.2315.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(\pi - i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)\right); 0 \leq \arg(z) < \frac{\pi}{2}$$

01.17.27.2316.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \pi\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.2317.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -\frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \pi\right); \frac{\pi}{2} < \arg(z) < \pi \vee (-iz \in \mathbb{R} \wedge 0 < -iz < 1) \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.2318.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) - \pi\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2319.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\sqrt{z^2+1}}{2z\sqrt{-\frac{z^2+1}{z^4}}}\left(\sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \pi \sqrt{-\frac{1}{z^2}}\right)$$

Involving $\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.17.27.2320.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right); 0 \leq \arg(z) < \frac{\pi}{2} \vee (iz \in \mathbb{R} \wedge -1 < iz < 0)$$

01.17.27.2321.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) + \frac{\pi}{2}; -\frac{\pi}{2} < \arg(z) < 0 \vee (iz \in \mathbb{R} \wedge iz < -1)$$

01.17.27.2322.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = -i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{\pi}{2}; \frac{\pi}{2} < \arg(z) < \pi \vee (iz \in \mathbb{R} \wedge iz > 1)$$

01.17.27.2323.01

$$\csc^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{\pi}{2}; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (iz \in \mathbb{R} \wedge 0 < iz < 1)$$

01.17.27.2324.01

$$\operatorname{csc}^{-1}\left(\frac{z}{\sqrt{z^2+1}}\right) = \frac{\pi\sqrt{z^2}}{2z} - z\sqrt{-\frac{z^2+1}{z^2}}\sqrt{\frac{1}{z^2+1}}\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+a}}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2325.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i\operatorname{sech}^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2326.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i\operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) < 0 \bigvee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2327.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = -i\operatorname{sech}^{-1}(z) + \pi /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.2328.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = i\operatorname{sech}^{-1}(z) + \pi /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2329.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right) = \frac{\pi}{2}\left(1 - \sqrt{\frac{1}{z^2}}z\right) - \frac{z\sqrt{z}}{\sqrt{-1+z}}\sqrt{\frac{1}{z^2}}\sqrt{\frac{1-z}{z}}\operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.17.27.2330.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{z^2}}{\sqrt{z^2+1}}\right) = \frac{\sqrt{-z^2(z^2+1)}}{\sqrt{z^2}\sqrt{-z^2-1}}\left(\frac{\pi}{2} - \frac{1}{2}z^2\sqrt{-\frac{1}{z^4}}\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{a-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2331.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \operatorname{sech}^{-1}(z) ; 0 < \arg(z) < \frac{\pi}{2}$$

01.17.27.2332.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \operatorname{sech}^{-1}(z) ; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.17.27.2333.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \pi - i \operatorname{sech}^{-1}(z) ; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.2334.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = i \operatorname{sech}^{-1}(z) + \pi ; -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2335.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = -i \operatorname{sech}^{-1}(z) - \pi ; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2336.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{1-z^2}}\right) = \sqrt{\frac{z^2-1}{z^2}} \sqrt{\frac{z^2}{z^2-1}} \left(\frac{\pi}{2} \left(1 - \sqrt{\frac{1}{z^2}} z \right) + \frac{\sqrt{z-1} \sqrt{z}}{\sqrt{\frac{1-z}{z}}} \sqrt{\frac{1}{z^2}} \operatorname{sech}^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.17.27.2337.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) ; 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2338.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{1}{2} i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \frac{\pi}{2} ; \frac{\pi}{2} \leq \arg(z) < \pi \vee -\frac{\pi}{2} \leq \arg(z) < 0$$

01.17.27.2339.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - \frac{1}{2} z^2 \sqrt{-\frac{1}{z^4}} \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.17.27.2340.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /; 0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2341.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{\pi}{2} + i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;$$

$$\frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2342.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) - \frac{\pi}{2} /; (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.2343.01

$$\csc^{-1}\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right) = \frac{1}{2} \sqrt{\frac{z^2}{z^2+1}} \sqrt{\frac{z^2+1}{z^2}} \pi - z^2 \sqrt{-\frac{1}{z^4}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+a}}\right)$

Involving $\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2344.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \operatorname{sech}^{-1}(z) /; 0 < \arg(z) < \frac{\pi}{2}$$

01.17.27.2345.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \operatorname{sech}^{-1}(z) /; -\frac{\pi}{2} \leq \arg(z) \leq 0$$

01.17.27.2346.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \pi - i \operatorname{sech}^{-1}(z) /; \frac{\pi}{2} \leq \arg(z) < \pi$$

01.17.27.2347.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = i \operatorname{sech}^{-1}(z) + \pi /; -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2348.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = -i \operatorname{sech}^{-1}(z) - \pi /; (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2349.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2-1}}\right) = \frac{\pi}{2} \sqrt{\frac{z^2}{z^2-1}} \sqrt{\frac{z^2-1}{z^2}} \left(1 - \sqrt{\frac{1}{z^2}} z\right) + \frac{(-z)^{3/2} z}{\sqrt{z-1} \sqrt{z+1}} \sqrt{\frac{1}{z}} \sqrt{\frac{z^2-1}{z^4}} \operatorname{sech}^{-1}(z)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right)$

01.17.27.2350.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{1}{2} \left(\pi - i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) \right) /; 0 \leq \arg(z) < \frac{\pi}{2} \bigvee -\pi < \arg(z) < -\frac{\pi}{2} \bigvee (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2351.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{1}{2} \left(i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \pi \right) /; \frac{\pi}{2} < \arg(z) < \pi \bigvee -\frac{\pi}{2} < \arg(z) < 0 \bigvee (i z \in \mathbb{R} \wedge i z < -1) \bigvee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2352.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = -\frac{1}{2} \left(i \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) + \pi \right) /; (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.2353.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \sqrt{\frac{z^2+1}{z^2}} \sqrt{\frac{z^2}{z^2+1}} \left(\frac{\pi}{2} - \frac{1}{2} \left(z^2 \sqrt{-\frac{1}{z^4}} \right) \operatorname{sech}^{-1}\left(\frac{z^2}{z^2+2}\right) \right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$ and $\operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$

01.17.27.2354.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) /;$$

$$0 \leq \arg(z) < \frac{\pi}{2} \vee -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < 0) \vee (i z \in \mathbb{R} \wedge -1 < i z < 1)$$

01.17.27.2355.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = i \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) + \frac{\pi}{2} /; \frac{\pi}{2} < \arg(z) < \pi \vee -\frac{\pi}{2} < \arg(z) < 0 \vee (i z \in \mathbb{R} \wedge i z < -1) \vee (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2356.01

$$\csc^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right) = \frac{\pi}{2} - \sqrt{\frac{z^2+1}{z^2}} \sqrt{\frac{z^2}{z^2+1}} z^2 \sqrt{-\frac{1}{z^4}} \operatorname{sech}^{-1}\left(\sqrt{\frac{z^2}{z^2+1}}\right)$$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$

Involving $\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2357.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi + 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{4} \leq \arg(z) \leq \frac{3\pi}{4}$$

01.17.27.2358.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; -\frac{3\pi}{4} \leq \arg(z) \leq -\frac{\pi}{4}$$

01.17.27.2359.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \pi - 2 \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) /; \frac{\pi}{4} \leq |\arg(z)| \leq \frac{3\pi}{4}$$

01.17.27.2360.01

$$\csc^{-1}\left(\frac{1}{2z\sqrt{1-z^2}}\right) = \frac{\pi \sqrt{1-2z^2} \sqrt{z^4-z^2}}{2 \sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \left(\frac{\sqrt{z^2}}{z} - \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{\frac{1}{\sqrt{2}z+1}} \sqrt{\sqrt{2}z+1} + \sqrt{-\frac{1}{z}} \sqrt{-z} \sqrt{\frac{1}{1-\sqrt{2}z}} \sqrt{1-\sqrt{2}z} + \frac{\sqrt{z^4-z^2}}{z \sqrt{z^2-1}} - 2 \right) + \frac{2 \sqrt{1-z} \sqrt{1-2z^2} \sqrt{z^4-z^2}}{\sqrt{z-1} \sqrt{-z^2} \sqrt{z^2-1} \sqrt{2z^2-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)$$

Involving $\csc^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right)$

Involving $\csc^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2361.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right) = \frac{\sqrt{z^2} \pi}{z} - \frac{2\sqrt{z^2} \sqrt{z-1}}{z\sqrt{1-z}} \operatorname{sech}^{-1}(z) ; |z| \geq \sqrt{2} \wedge \operatorname{Im}(z) \neq 0$$

01.17.27.2362.01

$$\csc^{-1}\left(\frac{z^2}{2\sqrt{-1+z^2}}\right) = -\frac{z^3 \sqrt{z^2-2} \sqrt{z^2-1}}{2\sqrt{1-z} (z+1) \sqrt{-z^4+3z^2-2}} \sqrt{\frac{1-z^2}{z^4}} \sqrt{\frac{1}{z}}$$

$$\sqrt{\frac{z+1}{z}} \left(\pi \left(\frac{z^3}{1-z^2} \sqrt{\frac{1-z^2}{z^2}} \sqrt{\frac{1-z^2}{z^4}} + \sqrt{\frac{1}{z^2}} z - \sqrt{\frac{1}{z}} \sqrt{\frac{z}{z+\sqrt{2}}} \sqrt{\frac{z+\sqrt{2}}{z}} \sqrt{z} + \sqrt{1-\frac{\sqrt{2}}{z}} \sqrt{\frac{1}{z}} \sqrt{-z} \sqrt{\frac{z}{z-\sqrt{2}}} - 2 \right) + \frac{4}{\sqrt{\frac{1}{z}-1}} \sqrt{1-\frac{1}{z}} \operatorname{sech}^{-1}(z) \right)$$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+cz^2}}}\right)$

Involving $\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right)$ and $\operatorname{sech}^{-1}\left(-\frac{i}{z}\right)$

01.17.27.2363.01

$$\csc^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1+z^2}}}\right) = -\frac{1}{2} i \operatorname{sech}^{-1}\left(-\frac{i}{z}\right) - \frac{\pi}{4} ; 0 < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2364.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 + z^2}}} \right) = \frac{1}{2} i \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) + \frac{\pi}{4} /; -\frac{\pi}{2} < \arg(z) \leq 0 \quad \bigvee \quad (i z \in \mathbb{R} \wedge 0 < i z < 1)$$

01.17.27.2365.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 + z^2}}} \right) = \frac{1}{2} i \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) - \frac{\pi}{4} /; \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.2366.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 + z^2}}} \right) = \frac{\pi}{4} - \frac{1}{2} i \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) /; -\pi < \arg(z) < -\frac{\pi}{2} \quad \bigvee \quad (i z \in \mathbb{R} \wedge i z > 1)$$

01.17.27.2367.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 + z^2}}} \right) = \frac{\sqrt{1 - i z}}{2 \sqrt{i z - 1}} \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) - \frac{\pi}{4} /; 0 < \arg(z) \leq \pi$$

01.17.27.2368.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 + z^2}}} \right) = \frac{\pi}{4} - \frac{\sqrt{1 - i z}}{2 \sqrt{i z - 1}} \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) /; -\pi < \arg(z) \leq 0$$

01.17.27.2369.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{z^2 + 1}}} \right) = \frac{i \sqrt{-z^2}}{z} \left(\frac{\sqrt{1 - i z}}{2 \sqrt{i z - 1}} \operatorname{sech}^{-1} \left(-\frac{i}{z} \right) - \frac{\pi}{4} \right)$$

Involving $\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 - z^2}}} \right)$ and $\operatorname{sech}^{-1} \left(\frac{1}{z} \right)$

01.17.27.2370.01

$$\operatorname{csc}^{-1} \left(\frac{\sqrt{2}}{\sqrt{1 - \sqrt{1 - z^2}}} \right) = \frac{1}{2} \left(i \operatorname{sech}^{-1} \left(\frac{1}{z} \right) + \frac{\pi}{2} \right) /; 0 < \arg(z) \leq \frac{\pi}{2} \quad \bigvee \quad (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2371.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2372.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); \frac{\pi}{2} < \arg(z) \leq \pi$$

01.17.27.2373.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right); -\pi < \arg(z) \leq -\frac{\pi}{2}$$

01.17.27.2374.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} < \arg(z) \leq \frac{\pi}{2}$$

01.17.27.2375.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right); \operatorname{Re}(z) < 0 \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.2376.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2}}{\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{\sqrt{z^2}}{2z}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2/\left(1-\sqrt{1-z^2}\right)}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2/\left(1-\sqrt{1-z^2}\right)}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2377.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); 0 < \arg(z) < \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2378.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); -\frac{\pi}{2} \leq \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2379.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = -\frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); \frac{\pi}{2} \leq \arg(z) \leq \pi$$

01.17.27.2380.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) - \frac{\pi}{2}\right); -\pi < \arg(z) < -\frac{\pi}{2}$$

01.17.27.2381.01

$$\csc^{-1}\left(\sqrt{\frac{2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}z \sqrt{\frac{1}{z^2} \left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)}$$

Involving $\csc^{-1}\left(\sqrt{2z^2} / \left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$

Involving $\csc^{-1}\left(\sqrt{2z^2} / \left(z\sqrt{1-\sqrt{1-z^2}}\right)\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2382.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2383.01

$$\csc^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2384.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z^2}}{z\sqrt{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1-z^2})}\right)$

Involving $\operatorname{csc}^{-1}\left(\frac{1}{z}\sqrt{2z^2/(1-\sqrt{1-z^2})}\right)$ and $\operatorname{sech}^{-1}\left(\frac{1}{z}\right)$

01.17.27.2385.01

$$\operatorname{csc}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}\left(\frac{1}{z}\right) + \frac{\pi}{2}\right); 0 < \arg(z) \leq \pi \vee (z \in \mathbb{R} \wedge 0 < z < 1)$$

01.17.27.2386.01

$$\operatorname{csc}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right); -\pi < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2387.01

$$\operatorname{csc}^{-1}\left(\frac{1}{z}\sqrt{\frac{2z^2}{1-\sqrt{1-z^2}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - \frac{\sqrt{1-z}}{\sqrt{z-1}} \operatorname{sech}^{-1}\left(\frac{1}{z}\right)\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z}/\sqrt{z-\sqrt{z^2-1}}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z}/\sqrt{z-\sqrt{z^2-1}}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2388.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}(z)\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.2389.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}(z) + \frac{\pi}{2}\right); -\frac{\pi}{2} < \arg(z) < 0 \vee (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2390.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - i \operatorname{sech}^{-1}(z)\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.2391.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}(z) + \frac{3\pi}{2}\right); -\pi < \arg(z) < -\frac{\pi}{2} \vee (z \in \mathbb{R} \wedge z < -1)$$

01.17.27.2392.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = -\frac{1}{2}\left(i \operatorname{sech}^{-1}(z) + \frac{3\pi}{2}\right); (z \in \mathbb{R} \wedge -1 < z < 0)$$

01.17.27.2393.01

$$\operatorname{csc}^{-1}\left(\frac{\sqrt{2z}}{\sqrt{z-\sqrt{z^2-1}}}\right) = \frac{\sqrt{z-1} \sqrt{-iz} \sqrt{z}}{2\sqrt{\frac{1}{z}-1}} \sqrt{\frac{i}{z}} \sqrt{-\frac{1}{z+1}} \sqrt{-\frac{z+1}{z^2}} \operatorname{sech}^{-1}(z) - \frac{1}{4}\pi \sqrt{-\frac{1}{z+1}} \sqrt{-\frac{z+1}{z^2}} \left(\sqrt{\frac{i}{z}} \sqrt{-iz} z + z - \sqrt{z^2}\right)$$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{z^2-1})}\right)$

Involving $\operatorname{csc}^{-1}\left(\sqrt{2z/(z-\sqrt{z^2-1})}\right)$ and $\operatorname{sech}^{-1}(z)$

01.17.27.2394.01

$$\operatorname{csc}^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{\pi}{2} - i \operatorname{sech}^{-1}(z)\right); 0 < \arg(z) \leq \frac{\pi}{2} \vee (z \in \mathbb{R} \wedge 0 < z < 1) \vee \arg(z) = -\frac{\pi}{2}$$

01.17.27.2395.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}(z) + \frac{\pi}{2}\right); -\frac{\pi}{2} < \arg(z) < 0 \quad \vee \quad (z \in \mathbb{R} \wedge z > 1)$$

01.17.27.2396.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(\frac{3\pi}{2} - i \operatorname{sech}^{-1}(z)\right); \frac{\pi}{2} < \arg(z) < \pi$$

01.17.27.2397.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{1}{2}\left(i \operatorname{sech}^{-1}(z) + \frac{3\pi}{2}\right); -\pi < \arg(z) < -\frac{\pi}{2} \quad \vee \quad (z \in \mathbb{R} \wedge z < 0)$$

01.17.27.2398.01

$$\csc^{-1}\left(\sqrt{\frac{2z}{z-\sqrt{z^2-1}}}\right) = \frac{\sqrt{-iz} z \sqrt{z-1} \sqrt{z+1}}{2\sqrt{1-z}} \sqrt{\frac{i}{z}} \sqrt{-\frac{1}{(z+1)^2}} \sqrt{-\frac{z+1}{z^2}} \operatorname{sech}^{-1}(z) - \frac{1}{4}\pi \sqrt{\frac{1}{z}} \sqrt{z} \sqrt{-\frac{1}{(z+1)^2}} \sqrt{z+1} \sqrt{-\frac{z+1}{z^2}} \left(\sqrt{\frac{i}{z}} \sqrt{-iz} z + z - \sqrt{z^2}\right)$$

Inequalities

01.17.29.0001.01

$$-\frac{\pi}{2} \leq \csc^{-1}(x) < 0 \quad /; \quad x \leq -1 \wedge x \in \mathbb{R}$$

01.17.29.0002.01

$$0 < \csc^{-1}(x) \leq -\frac{\pi}{2} \quad /; \quad x \geq 1 \wedge x \in \mathbb{R}$$

History

The function \csc^{-1} is encountered often in mathematics and the natural sciences.

Copyright

This document was downloaded from functions.wolfram.com, a comprehensive online compendium of formulas involving the special functions of mathematics. For a key to the notations used here, see <http://functions.wolfram.com/Notations/>.

Please cite this document by referring to the functions.wolfram.com page from which it was downloaded, for example:

<http://functions.wolfram.com/Constants/E/>

To refer to a particular formula, cite functions.wolfram.com followed by the citation number.

e.g.: <http://functions.wolfram.com/01.03.03.0001.01>

This document is currently in a preliminary form. If you have comments or suggestions, please email comments@functions.wolfram.com.

© 2001-2008, Wolfram Research, Inc.