

$$\sin^{-1} x = y, x \in [-1,1] \Leftrightarrow \sin y = x \text{ and } y \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$

$$\cos^{-1} x = y, x \in [-1,1] \Leftrightarrow \cos y = x \text{ and } y \in [0, \pi]$$

$$\tan^{-1} x = y, x \in \mathbb{R} \Leftrightarrow \tan y = x \text{ and } y \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$$

$$\csc^{-1} x = y, |x| \geq 1 \Leftrightarrow \csc y = x \text{ and } y \in \left(0, \frac{\pi}{2}\right] \cup \left(\pi, \frac{3\pi}{2}\right]$$

$$\sec^{-1} x = y, |x| \geq 1 \Leftrightarrow \sec y = x \text{ and } y \in \left(0, \frac{\pi}{2}\right] \cup \left(\pi, \frac{3\pi}{2}\right]$$

$$\cot^{-1} x = y, x \in \mathbb{R} \Leftrightarrow \cot y = x \text{ and } y \in (0, \pi)$$

Name	Usual notation	Definition	Domain of x for real result	Range of usual principal value (radians)	Range of usual principal value (degrees)
arcsine	$y = \arcsin x$	$x = \sin y$	$-1 \leq x \leq 1$	$-\pi/2 \leq y \leq \pi/2$	$-90^\circ \leq y \leq 90^\circ$
arccosine	$y = \arccos x$	$x = \cos y$	$-1 \leq x \leq 1$	$0 \leq y \leq \pi$	$0^\circ \leq y \leq 180^\circ$
arctangent	$y = \arctan x$	$x = \tan y$	all real numbers	$-\pi/2 < y < \pi/2$	$-90^\circ < y < 90^\circ$
arccotangent	$y = \operatorname{arccot} x$	$x = \cot y$	all real numbers	$0 < y < \pi$	$0^\circ < y < 180^\circ$
arcsecant	$y = \operatorname{arcsec} x$	$x = \sec y$	$x \leq -1$ or $1 \leq x$	$0 \leq y < \pi/2$ or $\pi/2 < y \leq \pi$	$0^\circ \leq y < 90^\circ$ or $90^\circ < y \leq 180^\circ$
arccosecant	$y = \operatorname{arccsc} x$	$x = \csc y$	$x \leq -1$ or $1 \leq x$	$-\pi/2 \leq y < 0$ or $0 < y \leq \pi/2$	$-90^\circ \leq y < 0^\circ$ or $0^\circ < y \leq 90^\circ$