

Formula

Inverse Trigonometric Functions

Function	Domain	Range (Principal value)
$y = \sin^{-1} x$	$[-1, 1]$	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
$y = \cos^{-1} x$	$[-1, 1]$	$[0, \pi]$
$y = \tan^{-1} x$	\mathbb{R}	$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$
$y = \operatorname{cosec}^{-1} x$	$\mathbb{R} - (-1, 1)$	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$
$y = \sec^{-1} x$	$\mathbb{R} - [-1, 1]$	$[0, \pi] - \left\{\frac{\pi}{2}\right\}$
$y = \cot^{-1} x$	\mathbb{R}	$(0, \pi)$

Property I

- (i) $\sin^{-1}(\sin \theta) = \theta, \quad \theta \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
- (ii) $\cos^{-1}(\cos \theta) = \theta, \quad \theta \in [0, \pi]$
- (iii) $\tan^{-1}(\tan \theta) = \theta, \quad \theta \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$
- (iv) $\operatorname{cosec}^{-1}(\operatorname{cosec} \theta) = \theta, \quad \theta \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] - \{0\}$
- (v) $\sec^{-1}(\sec \theta) = \theta, \quad \theta \in [0, \pi] - \left\{\frac{\pi}{2}\right\}$
- (vi) $\cot^{-1}(\cot \theta) = \theta, \quad \theta \in (0, \pi)$

Property II

- (i) $\sin(\sin^{-1} x) = x, \quad x \in [-1, 1]$
- (ii) $\cos(\cos^{-1} x) = x, \quad x \in [-1, 1]$
- (iii) $\tan(\tan^{-1} x) = x, \quad x \in \mathbb{R}$
- (iv) $\operatorname{cosec}(\operatorname{cosec}^{-1} x) = x, \quad x \in \mathbb{R} - [-1, 1]$
- (v) $\sec(\sec^{-1} x) = x, \quad x \in \mathbb{R} - [-1, 1]$
- (vi) $\cot(\cot^{-1} x) = x, \quad x \in \mathbb{R}$