

1 4.6: Inverse Trig Functions and Their Derivatives

sin, cos, tan and one-to-one functions:

$y = \sin^{-1} x$ (or $\arcsin x$) if and only if

$y = \cos^{-1} x$ if and only if

$y = \tan^{-1} x$ if and only if

Derivative of $y = \sin^{-1} x$:

$$\frac{d}{dx} \cos^{-1} x =$$

$$\frac{d}{dx} \tan^{-1} x =$$

$$\frac{d}{dx} \sec^{-1} x =$$

Examples:

Find the exact value of $\cos^{-1} \left(-\frac{1}{2} \right)$.

Find the exact value of each of the following:

$$\tan\left(\cos^{-1}\left(-\frac{3}{4}\right)\right)$$

$$\sin\left(2\arcsin\left(\frac{3}{5}\right)\right)$$

Compute $\lim_{x \rightarrow 0^-} \tan^{-1}\left(\frac{1-x^2}{2x^2-x}\right)$

On Your Own: Find the derivative of $f(x) = x \arcsin x + \sqrt{1-x^2}$

$\arcsin x$