

LESSON 8: INVERSE TRIG FUNCTIONS

Objective: 1. To define the inverse trig functions

Inverse Trig Functions

Function	Domain	Range
1. $y = \sin^{-1} x$	$-1 \leq x \leq 1$	$-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
2. $y = \cos^{-1} x$	$-1 \leq x \leq 1$	$0 \leq y \leq \pi$
3. $y = \tan^{-1} x$	$-\infty < x < \infty$	$-\frac{\pi}{2} < y < \frac{\pi}{2}$
4. $y = \cot^{-1} x$	$-\infty < x < \infty$	$0 < y < \pi$
5. $y = \sec^{-1} x$	$ x \geq 1$	$0 < y < \pi, y \neq \frac{\pi}{2}$
6. $y = \csc^{-1} x$	$ x \geq 1$	$-\frac{\pi}{2} < y < \frac{\pi}{2}, y \neq 0$

Examples

1. Evaluate the following

a. $\sin^{-1}\left(\frac{1}{2}\right)$

b. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

c. $\tan^{-1}\left(\frac{\sqrt{3}}{3}\right)$

Examples for Lesson 8, Derivatives, Cont.

2. Given $y = \cos^{-1}\left(-\frac{4}{5}\right)$, find the exact values in quadrant II of $\cos y$, $\sin y$, $\tan y$, $\cot y$, $\sec y$, $\csc y$

3. Find the exact values of the following

a. $\sin^{-1}\left(\sin\frac{\pi}{3}\right)$

b. $\cos(\cos^{-1}(-0.56))$

c. $\sin^{-1}\left(\sin\left(\frac{7\pi}{5}\right)\right)$

d. $\tan^{-1}\left(\tan\left(-\frac{4\pi}{5}\right)\right)$

4. Find the exact value of $\cos\left[2\sin^{-1}\left(-\frac{5}{13}\right)\right]$

