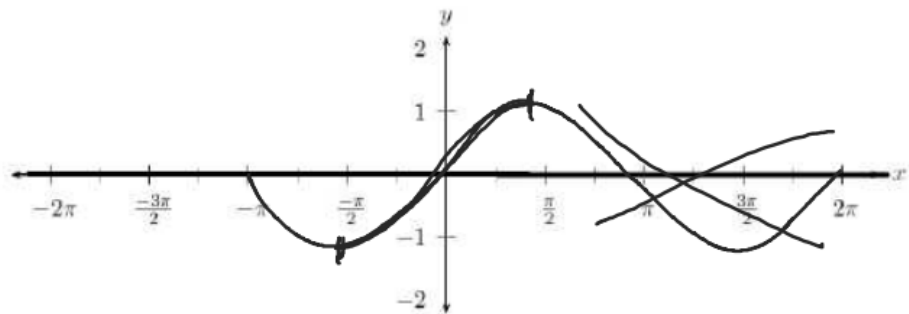


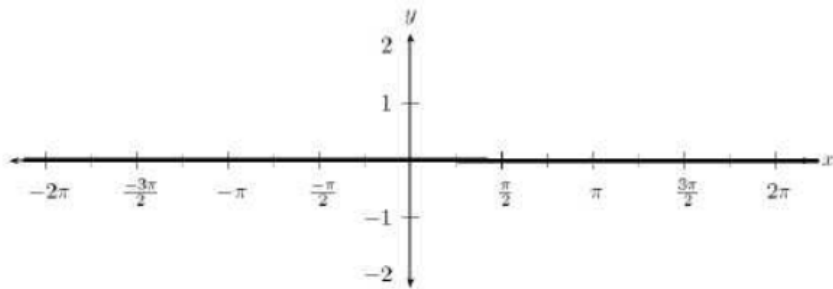
What you'll Learn About

- Inverse Trigonometric Functions and their Graphs

The graph of $y = \sin x$



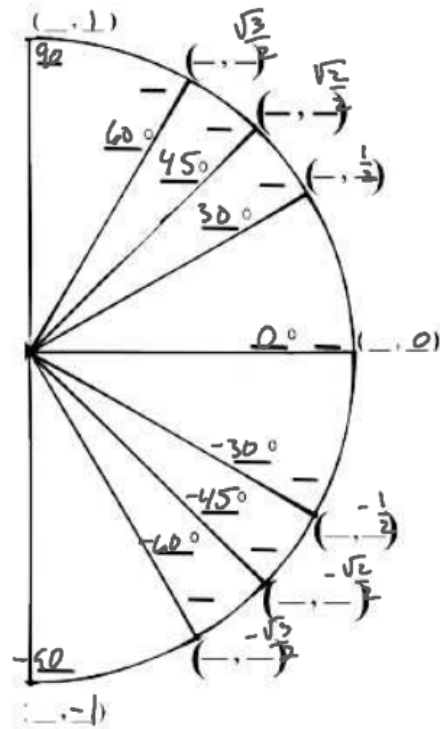
The graph of $y = \sin^{-1} x = \arcsin x$



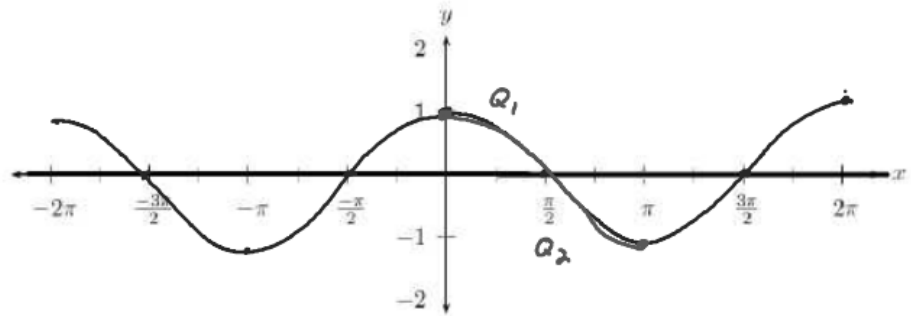
The Unit Circle and Inverse Functions

$$\sin^{-1}\left(\frac{1}{2}\right) = 30^\circ$$

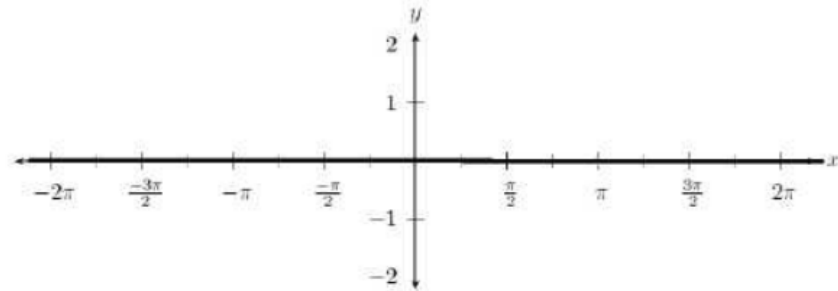
$$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -45^\circ$$



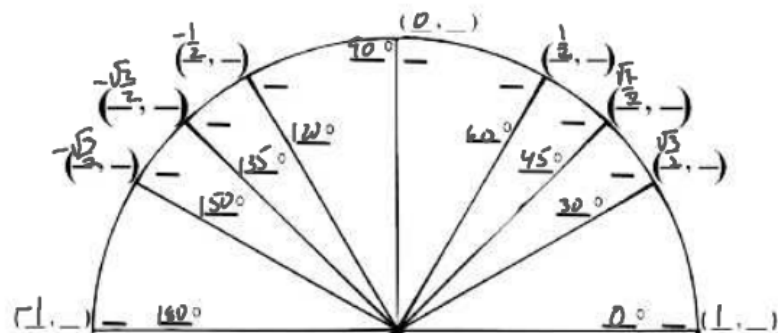
The graph of $y = \cos x$



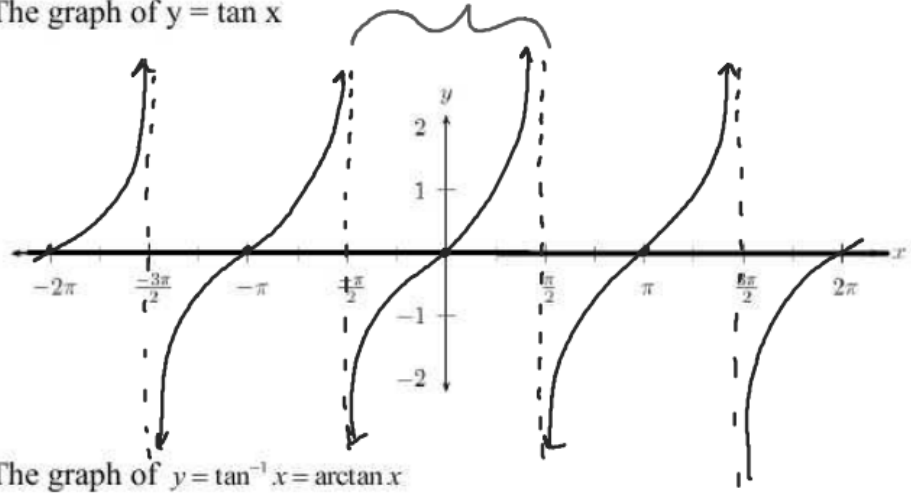
The graph of $y = \cos^{-1} x = \arccos x$



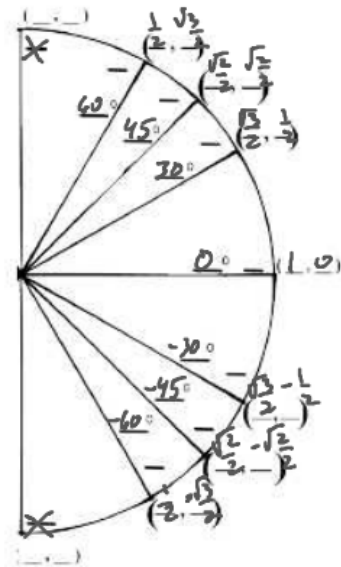
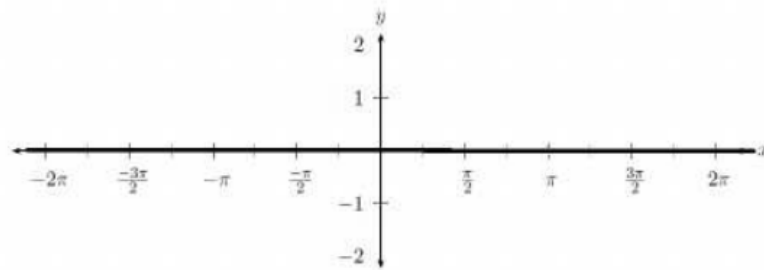
The Unit Circle and Inverse Functions



The graph of $y = \tan x$



The graph of $y = \tan^{-1} x = \arctan x$



$$\cos \theta = \frac{\sqrt{3}}{2}$$

$$\cos^{-1} \frac{\sqrt{3}}{2} = \theta$$

$$\tan \theta = \frac{Y}{X}$$

Find the exact value

A) $\cos^{-1} \frac{\sqrt{3}}{2}$

$$30^\circ, \frac{\pi}{6}$$

B) $\cos^{-1} \frac{1}{2}$

$$60^\circ, \frac{\pi}{3}$$

C) $\cos^{-1} \left(\frac{-1}{2} \right)$

$$120^\circ, \frac{2\pi}{3}$$

D) $\sin^{-1} \frac{-\sqrt{3}}{2}$

$$-60^\circ, -\frac{\pi}{3}$$

E) $\sin^{-1} \frac{1}{2}$

$$30^\circ, \frac{\pi}{6}$$

F) $\sin^{-1} \left(\frac{1}{\sqrt{2}} \right)$

$$45^\circ, \frac{\pi}{4}$$

$$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

G) $\tan^{-1}(1)$

$$45^\circ, \frac{\pi}{4}$$

H) $\tan^{-1}(\sqrt{3})$

$$60^\circ, \frac{\pi}{3}$$

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

$$-30^\circ, -\frac{\pi}{6}$$

$$\frac{\sqrt{3}}{2} \cdot \frac{2}{1}$$

J) $\cos^{-1}(0)$

$$90^\circ, \frac{\pi}{2}$$

K) $\sin^{-1}(-1)$

$$-90^\circ, -\frac{\pi}{2}$$

L) $\tan^{-1}(0)$

$$0^\circ, 0$$

$$- (1, 0)$$

$$\frac{0}{1}$$

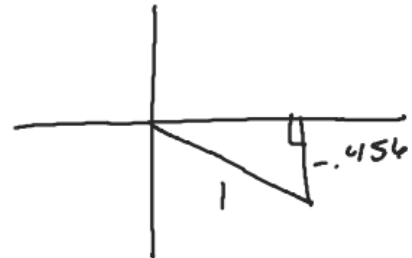
$$\arccos = \cos^{-1}$$

Use a calculator to find the approximate value in degrees. Draw the triangle that represents the situation.

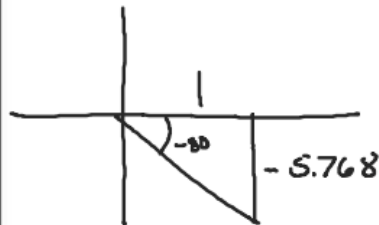
A) $\arccos(.456) = 62.87$



B) $\arcsin(-.456) = -27.13$

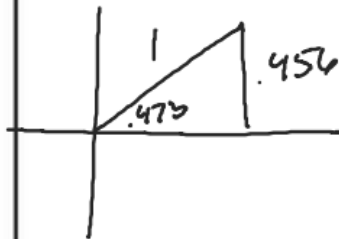


C) $\arctan(-5.768) = -80.16$

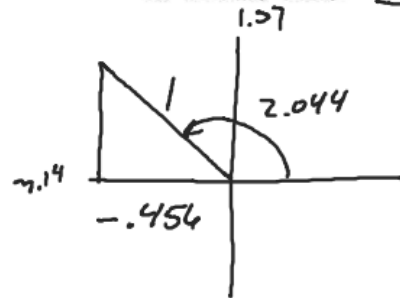


Use a calculator to find the approximate value in radians. Draw the triangle that represents the situation.

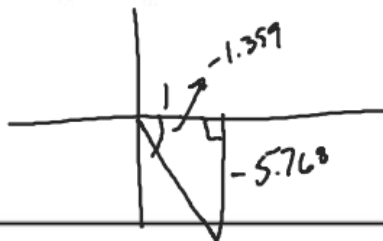
A) $\arcsin(.456) = .473$



B) $\arccos(-.456) = 2.044$



C) $\arctan(-5.768)$



Find the exact value without a calculator.

A) $\sin(\cos^{-1}(1/2))$ $\cos^{-1} \frac{1}{2} = 60^\circ$

$$\sin(60^\circ)$$
$$\frac{\sqrt{3}}{2}$$

B) $\cos(\tan^{-1}(0))$

$$\cos(0)$$

$$1$$

$$\frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}}$$

C) $\tan\left(\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)\right)$

$$\tan 45^\circ = 1$$

D) $\sin(\tan^{-1}(-\sqrt{3}))$

$$\sin(-60) = -\frac{\sqrt{3}}{2}$$

E) $\cos^{-1}\left(\sin\left(\frac{\pi}{4}\right)\right)$

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

$$\frac{\pi}{4}$$

F) $\sin^{-1}\left(\cos\left(\frac{\pi}{6}\right)\right)$

$$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$$

$$\frac{\pi}{3}$$