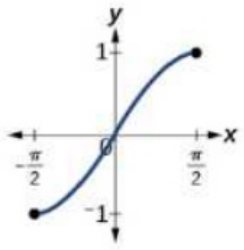
Inverse Sine

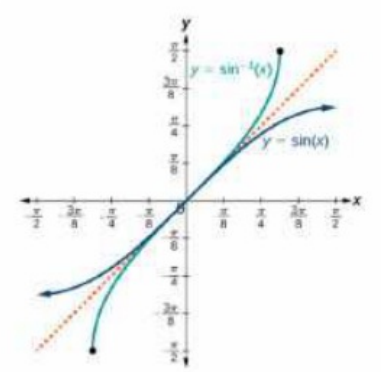
$\sin^{-1}$

Use inverse sine to find Angle measure

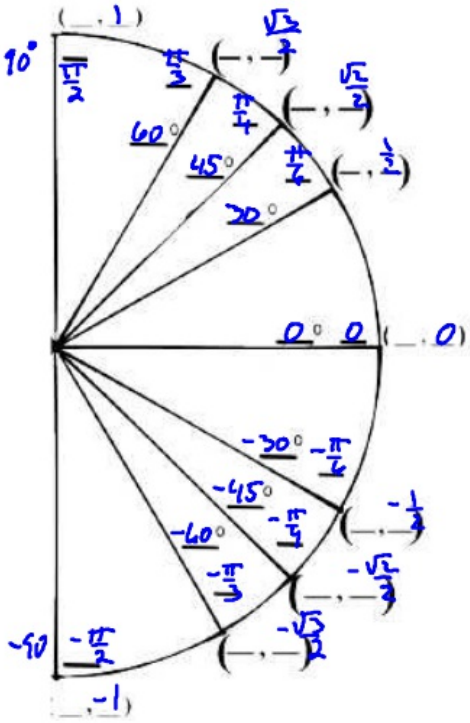
$\sin\theta = y$ $\quad \sin^{-1}(y) = \theta$

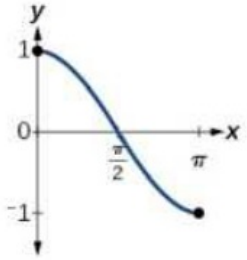


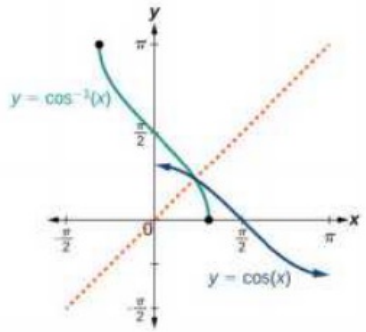
(a)



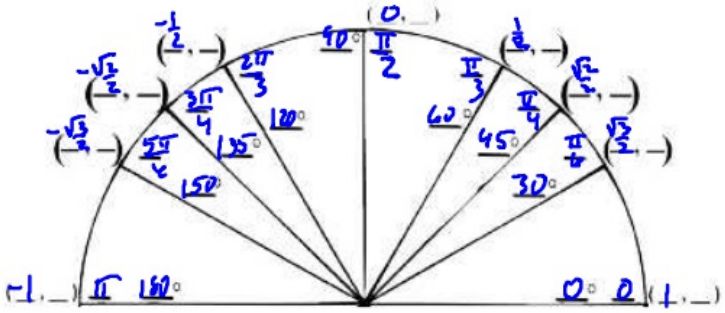
The Unit Circle and Inverse Functions

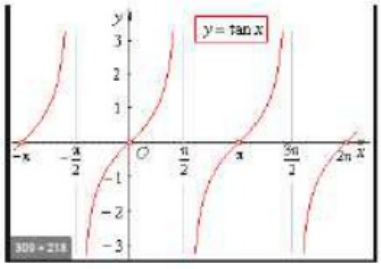


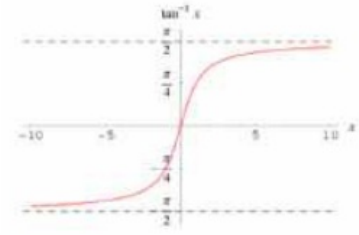




The Unit Circle and Inverse Functions







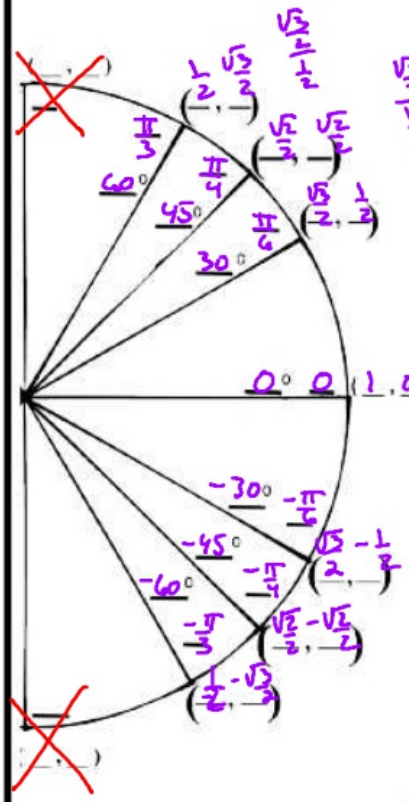
$(0,1)$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{y}{x}$

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

$\tan\theta = 1$

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



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

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

$\frac{0}{1}$

$\sin^{-1}$ arcsin

$\cos^{-1}$ arccos

$\tan^{-1}$ arctan

Find the exact value

A) $\cos^{-1}\frac{\sqrt{3}}{2}$ $30°, \frac{\pi}{6}$

B) $\cos^{-1}\frac{1}{2}$ $60°, \frac{\pi}{3}$

C) $\cos^{-1}\left(\frac{-1}{2}\right)$ $120°, \frac{2\pi}{3}$

D) $\sin^{-1}\frac{-\sqrt{3}}{2}$ $-60° \quad -\frac{\pi}{3}$

E) $\sin^{-1}\frac{1}{2}$ $30°, \frac{\pi}{6}$

F) $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$ $45, \frac{\pi}{4}$

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

Y

$-\frac{1}{2}$

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

X

G) $\tan^{-1}(1)$ $45°, \frac{\pi}{4}$

H) $\tan^{-1}(\sqrt{3})$ $60°, \frac{\pi}{3}$

I) $\tan^{-1}\left(\frac{-1}{\sqrt{3}}\right)$ $-30°, \frac{-\pi}{6}$

J) $\cos^{-1}(0)$ $90°, \frac{\pi}{2}$

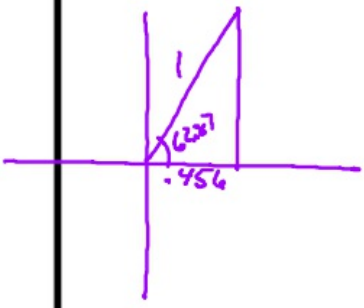
K) $\sin^{-1}(-1)$ $-90°, \frac{-\pi}{2}$

L) $\tan^{-1}(0)$ $0°$ 0

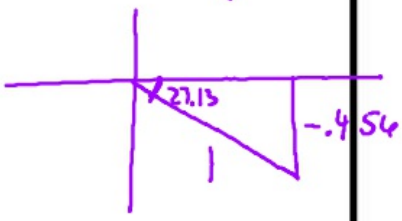
Use a calculator to find the approximate value in degrees.
Draw the triangle that represents the situation.

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

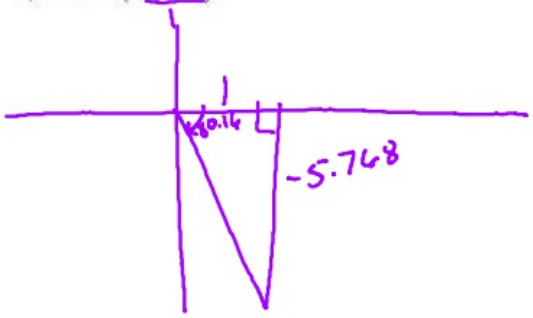
$\frac{.456}{1} = \frac{456}{1000}$



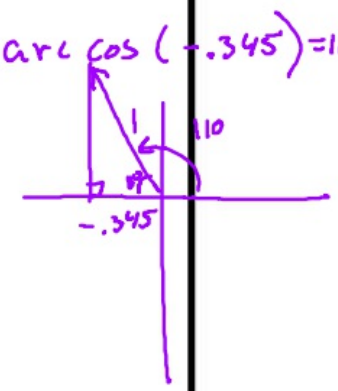
B) $\arcsin(-.456) = -27.13$



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

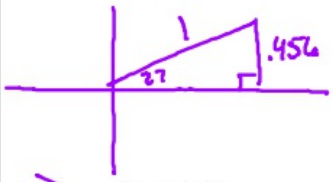


$\arccos(-.345) = 110$

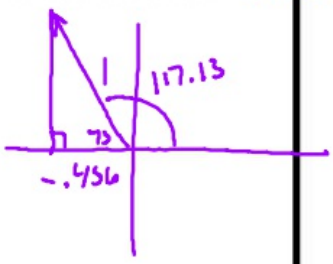


Use a calculator to find the approximate value in radians.
Draw the triangle that represents the situation.

A) $\arcsin(.456) = 27.13$



B) $\arccos(-.456) = 117.13$



C) ~~$\arctan(-5.768)$~~

Find the exact value without a calculator.

$\cos^{-1}\left(\frac{1}{2}\right) = 60^\circ$

A) $\sin\left(\cos^{-1}(1/2)\right)$

$\sin(60^\circ)$

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

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

$\cos(0)$

1

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

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

$\tan(45^\circ)$

1

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

$\sin(-60)$

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

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

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

45°

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

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

60°