

Students will be able to find the exact value of each expression.

Example 1: Find the exact value of each expression, if possible, without using a calculator.

a.) $\arccos 1/2$ I, II
 $\frac{\pi}{3}$

b.) $\arccos 0$ I, II y-axis
 $\frac{\pi}{2}$

c.) $\cos^{-1}(-2)$ I, II
 not possible
domain $-1 \leq x \leq 1$

d.) $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$ I, IV
 $-\frac{\pi}{4}$

Students will be able to use a calculator to find the inverse.

Example 2: Use a calculator to approximate the value of the expression, if possible. Round your answers to the nearest hundredth. **calculator needs to be in radians!**

a.) $\cos^{-1} 0.28$
 $\text{2nd} \text{ } \text{cos} (0.28)$
 1.29

b.) $\arctan 15$
 1.50

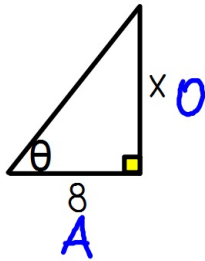
c.) $\arcsin(-1.3)$
 not possible

d.) $\tan^{-1} 5.9$
 1.40

Students will be able to use an inverse function.

Example 3: Use an inverse trigonometric function to write θ as a function of x . * Use SOH CAH TOA *

a.)

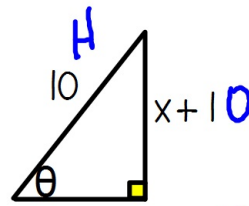


$$\tan \theta = \frac{x}{8}$$

$$\arctan(\tan \theta) = \arctan\left(\frac{x}{8}\right)$$

$$\theta = \arctan\left(\frac{x}{8}\right)$$

b.)



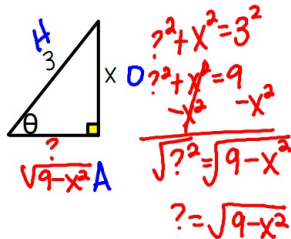
$$\sin \theta = \frac{x+1}{10}$$

$$\theta = \arcsin\left(\frac{x+1}{10}\right)$$

Students will be able to use all inverse functions with a right triangle.

Example 4: Find the length of the third side of the triangle in terms of x . Then find θ in terms of x for all three inverse trigonometric functions.

a.)



$$\sin \theta = \frac{x}{3}$$

$$\arcsin(\sin \theta) = \arcsin\left(\frac{x}{3}\right)$$

$$\theta = \arcsin\left(\frac{x}{3}\right)$$

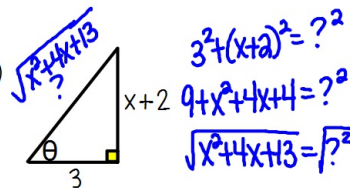
$$\cos \theta = \frac{\sqrt{9-x^2}}{3}$$

$$\theta = \arccos\left(\frac{\sqrt{9-x^2}}{3}\right)$$

$$\tan \theta = \frac{x}{\sqrt{9-x^2}}$$

$$\theta = \arctan\left(\frac{x}{\sqrt{9-x^2}}\right)$$

b.)



$$\theta = \arcsin\left(\frac{x+2}{\sqrt{x^2+4x+13}}\right)$$

$$\theta = \arccos\left(\frac{3}{\sqrt{x^2+4x+13}}\right)$$

$$\theta = \arctan\left(\frac{x+2}{3}\right)$$

Students will be able to use to find the exact value of the expression, if possible.

Example 5: Use the properties of the inverse functions to find the exact value of the expression, if possible.

a.) ~~$\tan(\arctan 25)$~~

$$\boxed{25}$$

b.) ~~$\sin(\arcsin(-0.1))$~~

$$\boxed{-.1}$$

c.) ~~$\arcsin(\sin 4\pi/3)$~~

$\frac{4\pi}{3} \leftarrow \text{III } (-)$
to move to IV
 $\boxed{-\frac{\pi}{3}}$

d.) ~~$\cos^{-1}(\tan 3\pi/4)$~~

$\cos^{-1}(-1)$ II x-axis
 $\boxed{\pi}$

Turn-in:

p.322 (12, 30, 62)

HW:

p.322 (5-13, 19-31, 45-63 odds)