

4.1 Basic Inverse Trigonometric Functions

1. Answers:

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

2. Answers:

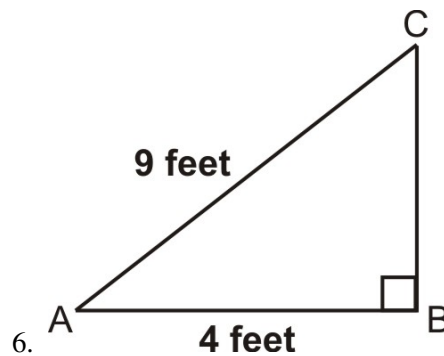
- $\frac{\pi}{2}, \frac{3\pi}{2}$
- $\frac{2\pi}{3}, \frac{5\pi}{3}$
- $\frac{11\pi}{6}, \frac{7\pi}{6}$

3. $\cos \theta = \frac{12}{17} \rightarrow \cos^{-1} \frac{12}{17} = 45.1^\circ$

4. $\sin \theta = \frac{25}{36} \rightarrow \sin^{-1} \frac{31}{36} = 59.44^\circ$

5. This problem uses tangent inverse.

- $\tan x = \frac{-23}{-14} \rightarrow x = \tan^{-1} \frac{23}{14} = 58.67^\circ$ (value graphing calculator will produce). *However, this is the reference angle.
- Our angle is in the third quadrant because both the x and y values are negative.
- The angle is $180^\circ + 58.67^\circ = 238.67^\circ$.



$$\cos A = \frac{4}{9}$$

$$\cos^{-1} \frac{4}{9} = A$$

$$\angle A = 63.6^\circ$$

7.

$$f(x) = 2x^3 - 5$$

$$y = 2x^3 - 5$$

$$x = 2y^3 - 5$$

$$x + 5 = 2y^3$$

$$\frac{x + 5}{2} = y^3$$

$$\sqrt[3]{\frac{x + 5}{2}} = y$$

8.

$$y = \frac{1}{3} \tan^{-1} \left(\frac{3}{4}x - 5 \right)$$

$$x = \frac{1}{3} \tan^{-1} \left(\frac{3}{4}y - 5 \right)$$

$$3x = \tan^{-1} \left(\frac{3}{4}y - 5 \right)$$

$$\tan(3x) = \frac{3}{4}y - 5$$

$$\tan(3x) + 5 = \frac{3}{4}y$$

$$\frac{4(\tan(3x) + 5)}{3} = y$$

9.

$$g(x) = 2 \sin(x - 1) + 4$$

$$y = 2 \sin(x - 1) + 4$$

$$x = 2 \sin(y - 1) + 4$$

$$x - 4 = 2 \sin(y - 1)$$

$$\frac{x - 4}{2} = \sin(y - 1)$$

$$\sin^{-1} \left(\frac{x - 4}{2} \right) = y - 1$$

$$1 + \sin^{-1} \left(\frac{x - 4}{2} \right) = y$$

10.

$$h(x) = 5 - \cos^{-1}(2x + 3)$$

$$y = 5 - \cos^{-1}(2x + 3)$$

$$x = 5 - \cos^{-1}(2y + 3)$$

$$x - 5 = -\cos^{-1}(2y + 3)$$

$$5 - x = \cos^{-1}(2y + 3)$$

$$\cos(5 - x) = 2y + 3$$

$$\cos(5 - x) - 3 = 2y$$

$$\frac{\cos(5 - x) - 3}{2} = y$$