

(1) Express the angle in terms of

(2) Find the exact radian measure of -560°

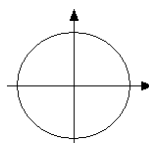
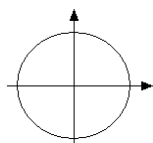
Degrees, Minutes, and Seconds

 39.30972222°

(3) Arc Length and Area of the Circular Sector. Given a circle of radius 8 inches find the following

(a) Find the area of the circular sector determine

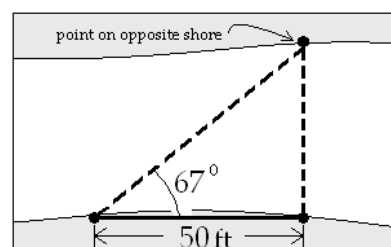
(b) Find the length of the arc that is determined by

by the given central angle $\frac{5\pi}{12}$.the given central angle 300° 

(4) Width of River. To estimate the width of a river an observer visually marks a point on the opposite shore.

Then they walk a straight 50 ft and denote the angle 67° is made with that point on the opposite shore, as shown in the figure below. **Approximate the width** of the river.

[Remember to set up an equation and show clear logical steps to a solution or solutions.]



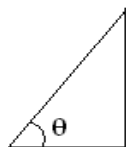
(5) Find the exact value of the six trigonometric

(6) Simplify

functions for the acute angle θ and the

following conditions.

$$\cot(\theta) = \frac{2}{\sqrt{21}}$$



$$\sin(\theta) = \underline{\hspace{1cm}}$$

$$\csc(\theta) = \underline{\hspace{1cm}}$$

$$\cos(\theta) = \underline{\hspace{1cm}}$$

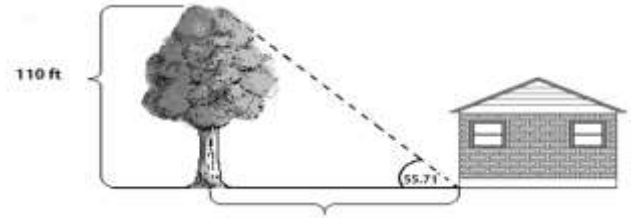
$$\sec(\theta) = \underline{\hspace{1cm}}$$

$$\tan(\theta) = \underline{\hspace{1cm}}$$

$$\frac{\csc(\beta) - 2\sec(\beta)}{\cot(\beta) - 2}$$

- (7) **Distance to Tree.** A historic tree stands in the park across from a neighborhood. The park service has listed the tree's present height as 110 ft. tall. In a house located near the edge of the park the residents have measured an angle from the ground at the base of the house to the top of the tree as 55.71° . **What** is the distance between the house and the base of the tree?

[Remember to set up a trigonometric equation and by clear and logical steps find a solution or solutions to that equation.]



- (8) **Verify** the identity.

$$(\cot(\alpha) + \tan(\alpha)) \tan(\alpha) = \sec^2(\alpha)$$

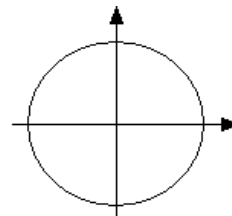
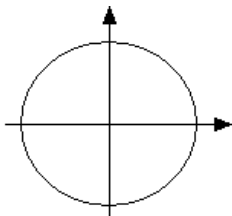
- (9) **Use** the formulas for negatives to **verify** the identity.

$$\cot(-x) \cos(-x) + \sin(-x) = -\csc(x)$$

- (10) **Find** the **exact** reference angles to

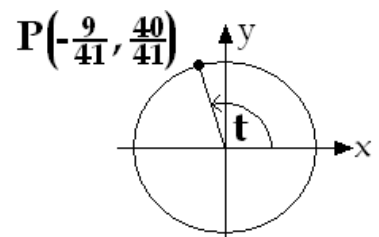
(a) -272° , $\theta_R = \underline{\hspace{2cm}}$

(b) 4 , $\theta_R = \underline{\hspace{2cm}}$



[The circle diagrams are there to help find the reference angle... not to take the place of the answer]

- (11) **Unit Circle.** Given the rectangular coordinates $P(-\frac{9}{41}, \frac{40}{41})$ on the unit circle (i.e. circle with radius 1) corresponding to the angle t shown. **Find** the **exact values** of the six trigonometric functions for angle t .



(12) Find the **reference angle** and **sign adjustment** and then **find the exact value** for these trigonometric functions of the following angles .

$$(a) \csc(-840^\circ) = \boxed{} \csc() =$$



Sign adjustment
(" + " or " - ")

Reference Angle

$$(b) \cot\left(\frac{7\pi}{6}\right) = \boxed{} \cot() =$$



Sign adjustment
(" + " or " - ")

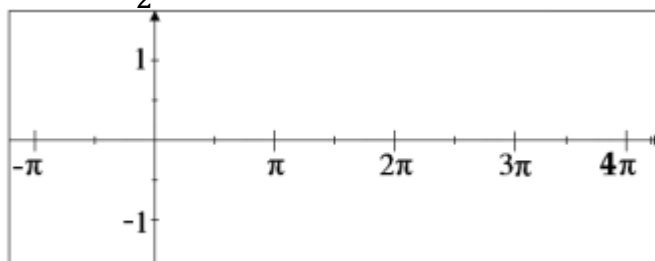
Reference Angle

(13) Use the **fundamental identities** to **write the first expression in terms of the second** for any acute angle θ .

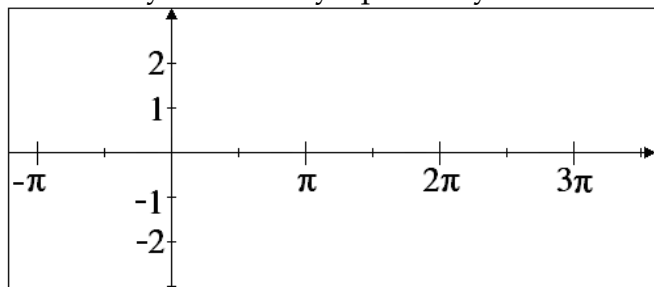
$$\sin(\theta); \cot(\theta)$$

(14) Refer to the graph of $y = \cos(x)$ to **find exact values** of x in the interval $[0, 4\pi)$ that satisfy the equation.

$$\cos(x) = \frac{1}{2}$$



(15) **Graph** several periods of $y = \csc(x)$
Show any vertical asymptotes by **dashed lines**.



Extra Credit:

(1) Find the **exact values** of $\cot(\theta)$ and $\csc(\theta)$ for each angle?

(a) $\theta = 540^\circ$

(b) $\theta = -\frac{\pi}{2}$

(2) Use the Fundamental identities to find the values of the six trigonometric functions for the given conditions.

$$\cos(\theta) = -\frac{1}{4} \text{ and } \sin(\theta) > 0$$



$$\sin(\theta) = \underline{\hspace{2cm}}$$

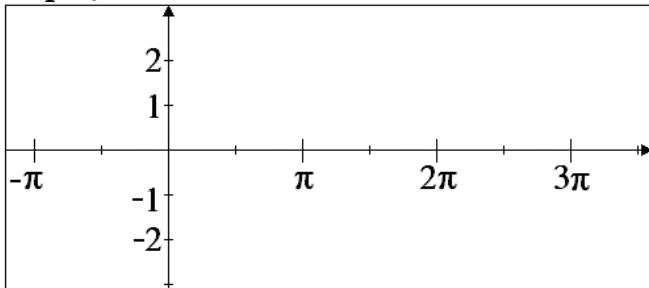
$$\csc(\theta) = \underline{\hspace{2cm}}$$

$$\sec(\theta) = \underline{\hspace{2cm}}$$

$$\tan(\theta) = \underline{\hspace{2cm}}$$

$$\cot(\theta) = \underline{\hspace{2cm}}$$

(3) Graph $y = 3 \csc^2(x) - 3 \cot^2(x)$



(4) Is it **illegal** to encourage someone to commit a crime?