Name:_____ Hour: _____ Date: _____

NOTES: Section 13.3 – Evaluate Trigonometric Functions of Any Angle

Goals: #1 - I can evaluate the 6 trig functions for a quadrantal function without using a calculator.

#2 - I can find the reference angle for any given angle, in both degrees and radians.

#3 - I can evaluate trig functions for special angles (multiples of 30° and 45°) in quadrants 1, 2, 3, and 4 without using a calculator.

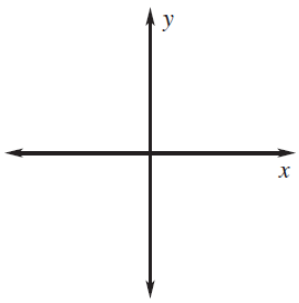
#4 - I can apply the formula for horizontal distance of a projectile launched in terms of initial velocity and launch angle.



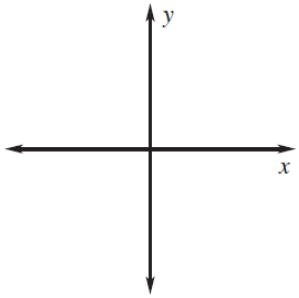
Homework: Lesson 13.3 Worksheet

Warm Up:

1. Draw an angle with the given measure in standard position.
   a. $\frac{26\pi}{9}$



   b. $-900°$



2. Evaluate the trigonometric function. When possible, give an exact answer. When using a calculator, round answers to the nearest <u>hundredth</u>.
   a. $\tan\frac{\pi}{6}$
   b. $\csc\frac{4\pi}{15}$

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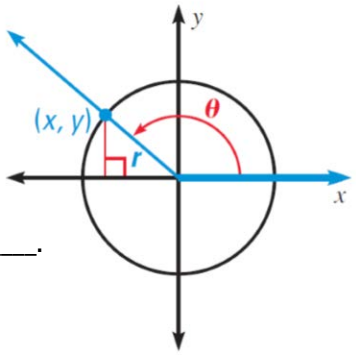
Notes:

We can evaluate trigonometric functions of _____ angle.



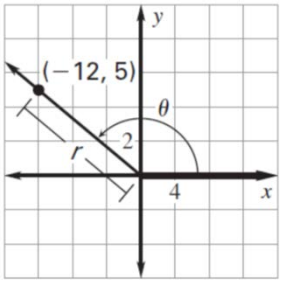
Let θ be an angle in standard position, and let (x, y) be the point where the _____ side of θ intersects the circle _____.

$\sin\theta =$ ——— $\csc\theta =$ ———

$\cos\theta =$ ——— $\sec\theta =$ ———

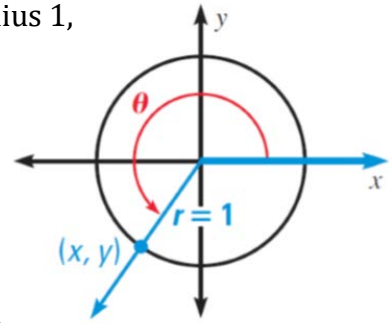
$\tan\theta =$ ——— $\cot\theta =$ ———

Example #1: Let $(-12, 5)$ be a point on the terminal side of an angle θ in standard position. Evaluate the six trigonometric functions of θ.



Notes:

The circle _____, which has center $(0, 0)$ and radius 1, is called the _____.



$\sin\theta =$ ——— $=$ ——— $=$ $\cos\theta =$ ——— $=$ ——— $=$

A _____ is an angle in standard position whose Terminal side lies on an _____. The meausre is always a multiple of _____ or _____.

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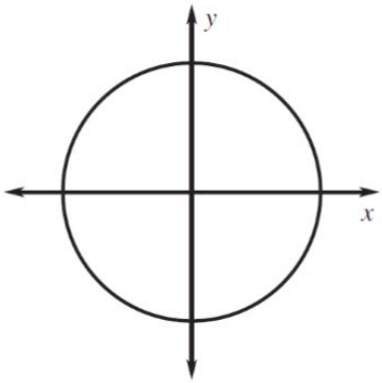
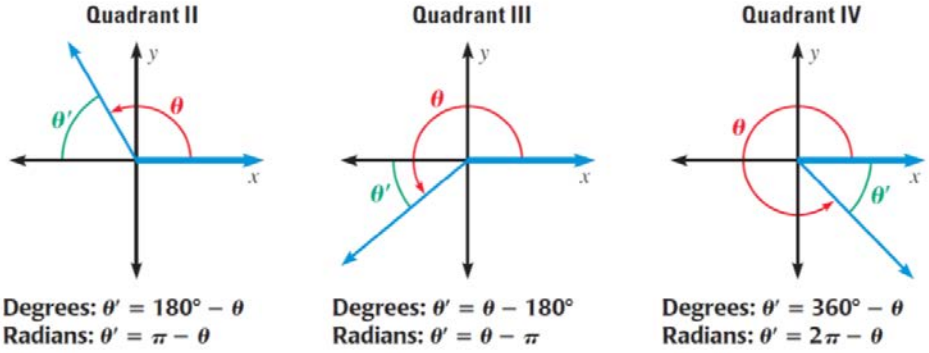
Example #2: Use the unit circle to evaluate the six trigonometric functions of $\theta = 450°$



Notes:

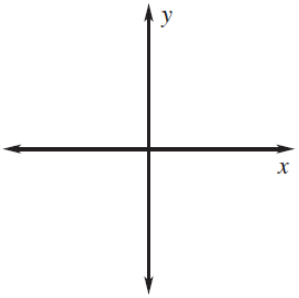
How can we find a trig function of _____ angle? We use _____.

The _____ for θ is the acute angle formed by the _____ side of θ and the _____.

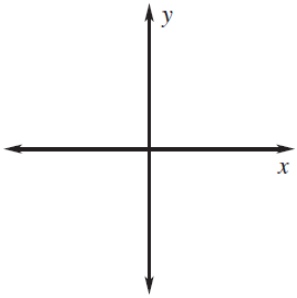


Example #3: Sketch the angle. Then find its reference angle. Answer in the unit of the given angle.

1. $\theta = -165°$



2. $\theta = \frac{7\pi}{4}$



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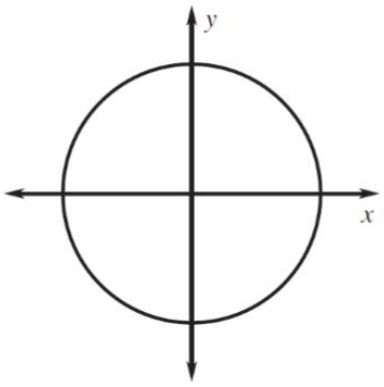
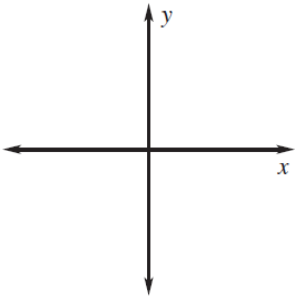
You practice:

1. Use the unit circle to evaluate the six trigonometric functions of $\theta = 4\pi$

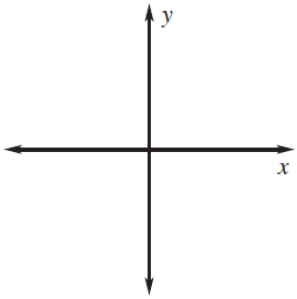


2. Sketch the angle. Then find its reference angle. Answer in the unit of the given angle.

a. $\theta = 470°$



b. $\theta = -\frac{7\pi}{3}$



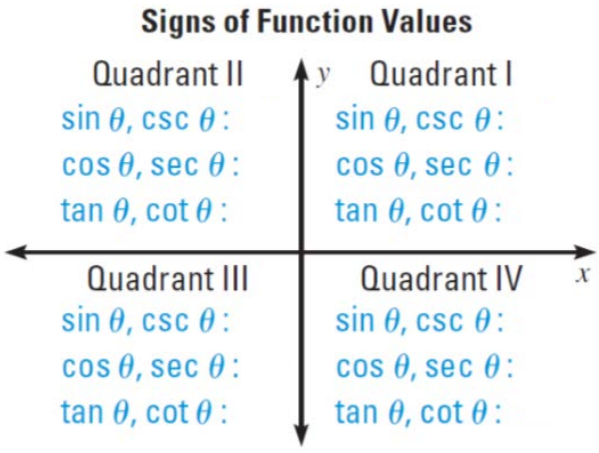
Notes:

Finally we can evaluate _____ trig function for _____ θ

STEP 1:

STEP 2:

STEP 3:



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Example #4: Evaluate the following trig functions.

1. $\cos(-225°)$
2. $\cot\frac{10\pi}{3}$

You practice: Evaluate the following trig functions.

1. $\tan(240°)$
2. $\sec\frac{-5\pi}{3}$

Notes:

The horizontal distance d (in feet) traveled by a projectile launced at an angle θ and with an initial speed v (in feet per second) is given by:

Example #5: You kick a soccer ball at an intial speed of 46 feet per second, projected an an angle of 30°. How far will the ball travel horizontally before hitting the ground?