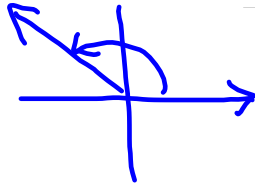


Convert the following into either degrees or radians then draw the angles in standard form.

1.  $135^\circ$

$\frac{3\pi}{4}$



2.  $\frac{3\pi}{8}$

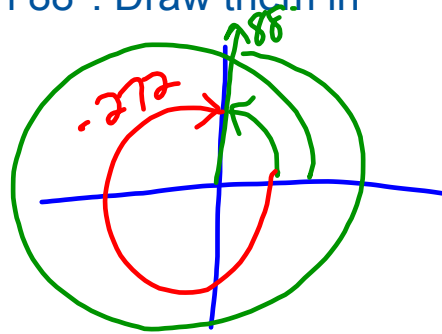
$67.5^\circ$

$\frac{3\pi}{8}$

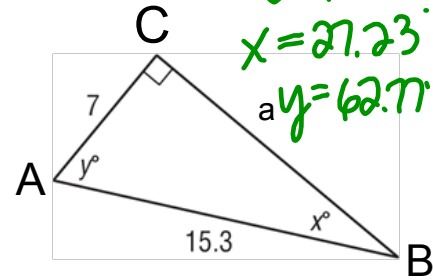


3. Find one angle with positive measure and one angle with negative measure coterminal with  $88^\circ$ . Draw them in standard position.

$448^\circ$   
 $-272^\circ$



4. Find all missing angles and side lengths.



$a = 13.6$   
 $x = 27.23^\circ$   
 $y = 62.77^\circ$

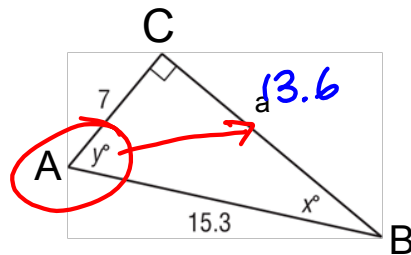
Convert the following into either degrees or radians then draw the angles in standard form.

1.  $135^\circ$

2.  $\frac{3\pi}{8}$

3. Find one angle with positive measure and one angle with negative measure coterminal with  $88^\circ$ . Draw them in standard position.

4. Find all missing angles and side lengths.



$7^2 + a^2 = 15.3^2$   
 $\sqrt{a^2} = \sqrt{185.09}$

SOH CAH TOA

$\sin X = \frac{7}{15.3}$

$\sin^{-1}\left(\frac{7}{15.3}\right) = X$

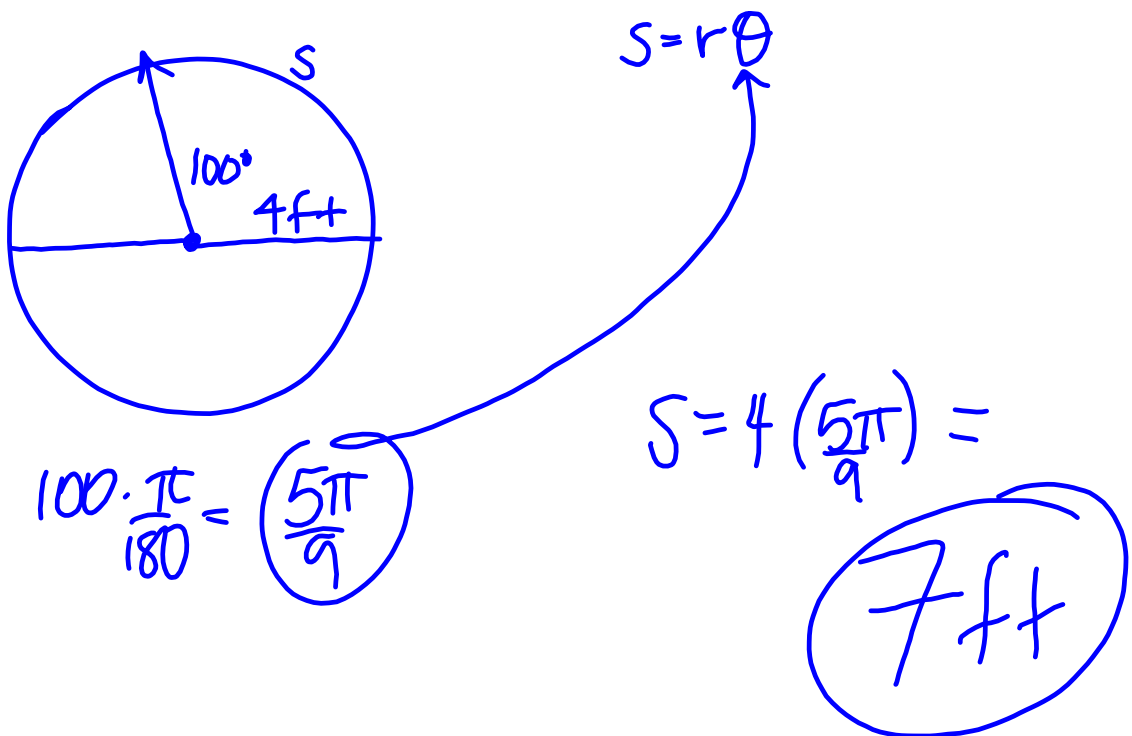
$X = 27.23^\circ$

$\sin y = \frac{13.6}{15.3}$

$\sin^{-1}\left(\frac{13.6}{15.3}\right) = X$

$X = 62.77^\circ$

? ? ?  
? Questions  
? on  
? ? ?  
? Homework  
? ? ?  
? ? ?



$$s = r\theta$$
$$s = 12 \cdot \left( 300 \cdot \frac{\pi}{180} \right) =$$

A blue banner with a gradient background. On the left, the word "LESSON" is written vertically in white. To its right, the numbers "12-3" are displayed in a large, light blue font. Further right, the text "Trigonometric Functions of General Angles" is written in white.

LESSON 12-3 Trigonometric Functions of General Angles

I can... find values of trigonometric functions for general angles.

## Introducing....the other 3!

sine

$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$$

cosecant

$$\csc A = \frac{\text{hypotenuse}}{\text{opposite}}$$

cosine

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

secant

$$\sec A = \frac{\text{hypotenuse}}{\text{adjacent}}$$

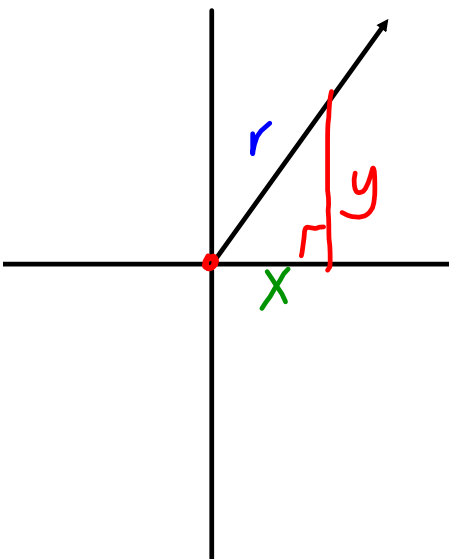
tangent

$$\tan A = \frac{\text{opposite}}{\text{adjacent}}$$

cotangent

$$\cot A = \frac{\text{adjacent}}{\text{opposite}}$$

SOH CAH TOA



$$\sin \theta = \frac{O}{H} = \frac{y}{r} \quad \csc \theta = \frac{H}{O} = \frac{r}{y}$$

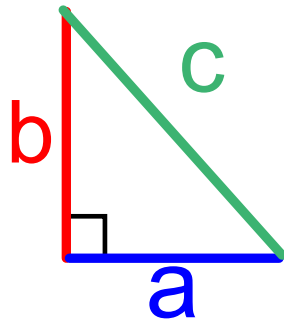
$$\cos \theta = \frac{A}{H} = \frac{x}{r} \quad \sec \theta = \frac{H}{A} = \frac{r}{x}$$

$$\tan \theta = \frac{O}{A} = \frac{y}{x} \quad \cot \theta = \frac{A}{O} = \frac{x}{y}$$

REMEMBER...

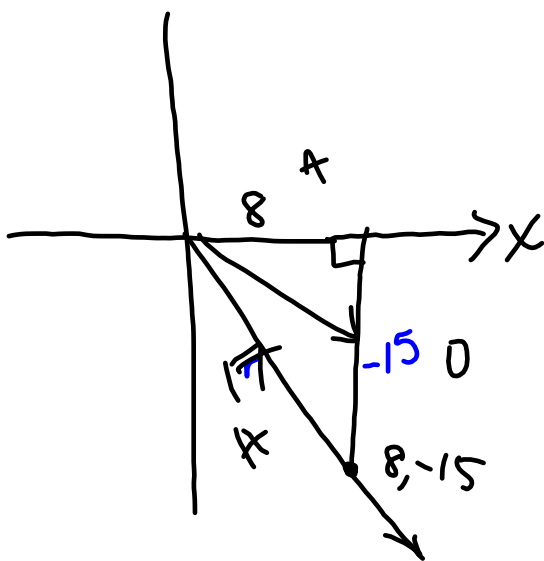
## Pathagorean Theorem

$$a^2 + b^2 = c^2$$



**\*\* Only on Right Triangles \*\***

1. The terminal side of  $\theta$  in standard position contains the point  $(8, -15)$ . Find the exact values of the six trigonometric functions of  $\theta$ .



$$\begin{aligned} 8^2 + (-15)^2 &= r^2 \\ 289 &= r^2 \\ 17 &= r \end{aligned}$$

SOH CAH TOA

$$\sin \theta = \frac{-15}{17} \quad \csc \theta = \frac{17}{-15}$$

$$\cos \theta = \frac{8}{17} \quad \sec \theta = \frac{17}{8}$$

$$\tan \theta = \frac{-15}{8} \quad \cot \theta = \frac{8}{-15}$$

2. Find the exact values of the six trigonometric functions of  $\theta$  if the terminal side of  $\theta$  contains the point  $(-3, 4)$ .

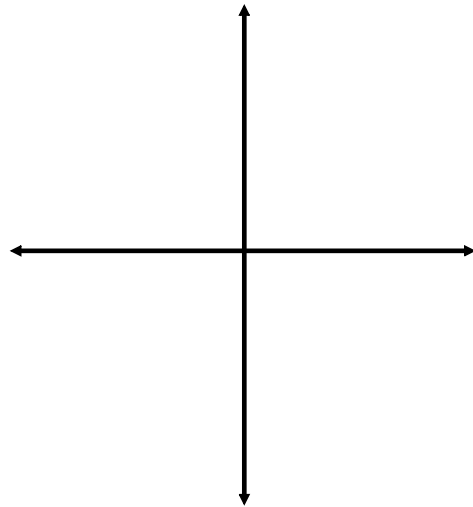
$$\frac{4}{5}$$

$$\frac{-3}{5}$$

$$\frac{4}{-3}$$

$$\frac{5}{-3}$$

$$\frac{-3}{4}$$



You Try!! Draw the angles!

3. Find the exact values of the six trigonometric functions of  $\theta$  if the terminal side of  $\theta$  contains the point  $(6, 25)$ .

4. Find the exact values of the six trigonometric functions of  $\theta$  if the terminal side of  $\theta$  contains the point  $(-9, -10)$ .

5. The terminal side of  $\theta$  in standard position contains the point at  $(0, -2)$ . Find the values of the six trigonometric functions of  $\theta$ .

$$\begin{array}{c} (0, -2) \\ X \quad Y \end{array}$$

$$X=0 \quad Y=-2 \quad r=-2$$

SOH CAH TOA

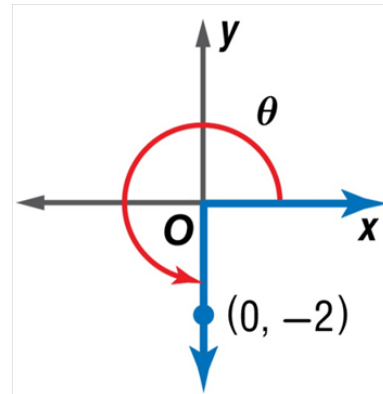
$$\sin \theta = \frac{O}{H} = \frac{y}{r} = \frac{-2}{-2} = 1 \quad \csc \theta = 1$$

$$\cos \theta = \frac{A}{H} = \frac{x}{r} = \frac{0}{-2} = 0$$

$$\sec \theta = \frac{r}{x} = \frac{-2}{0} = \text{undef}$$

$$\tan \theta = \frac{O}{A} = \frac{y}{x} = \frac{-2}{0} = \text{undef}$$

$$\cot \theta = \frac{x}{y} = \frac{0}{-2} = 0$$

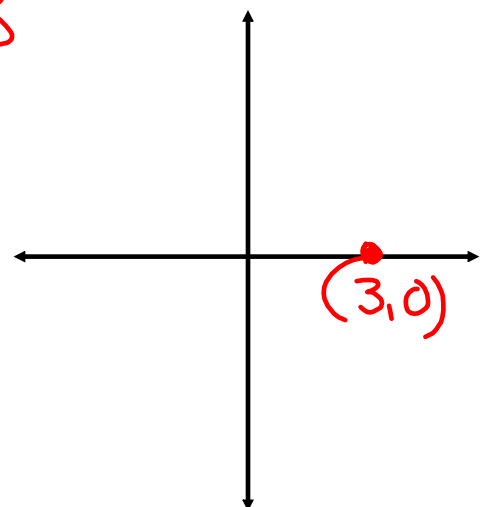


6. The terminal side of  $\theta$  in standard position contains the point at  $(3, 0)$ . Find the values of the six trigonometric functions of  $\theta$ .

$$\underbrace{X=3 \quad Y=0 \quad r=3}$$

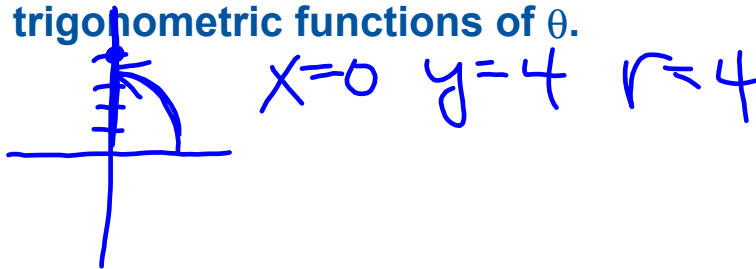
$$\sin \theta = \frac{O}{H} = \frac{y}{r} = \frac{0}{3} = 0$$

$$\cos \theta = \frac{A}{H} = \frac{x}{r} = \frac{3}{3} = 1$$



## You Try!!

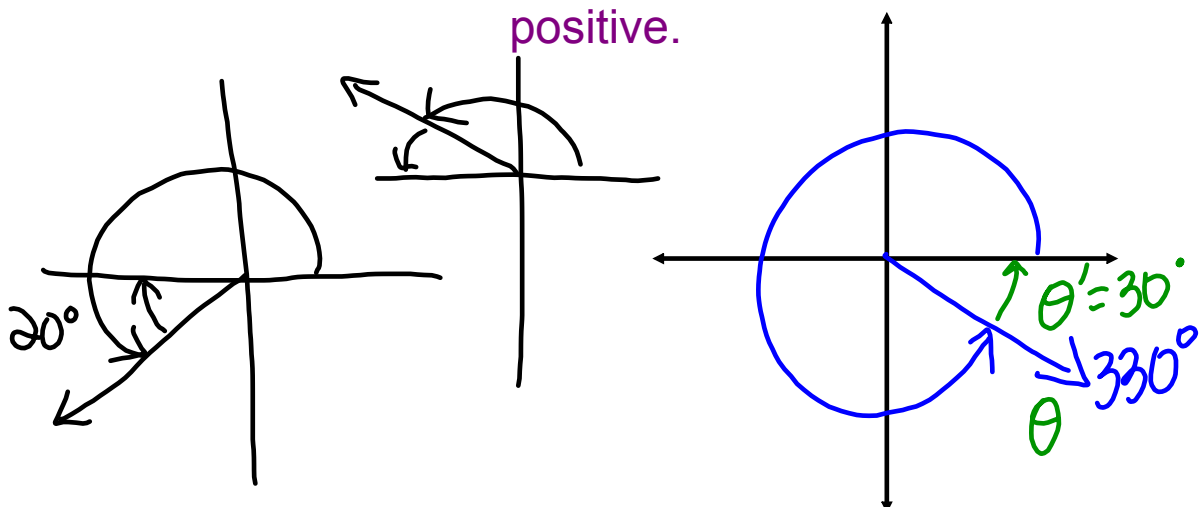
7. The terminal side of  $\theta$  in standard position contains the point at  $(0, 4)$ . Find the values of the six trigonometric functions of  $\theta$ .



8. The terminal side of  $\theta$  in standard position contains the point at  $(-5, 0)$ . Which of the following trigonometric functions of  $\theta$  is incorrect?

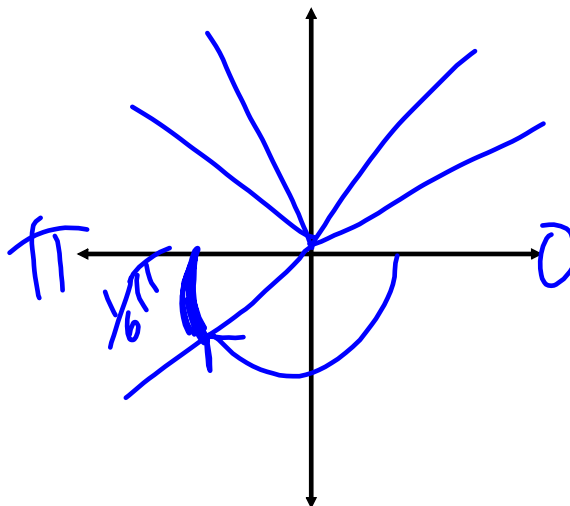
8. Sketch  $330^\circ$ . Then find its reference angle.

★ A reference angle is an acute angle that makes the angle a complete  $180^\circ$ . It is always positive.





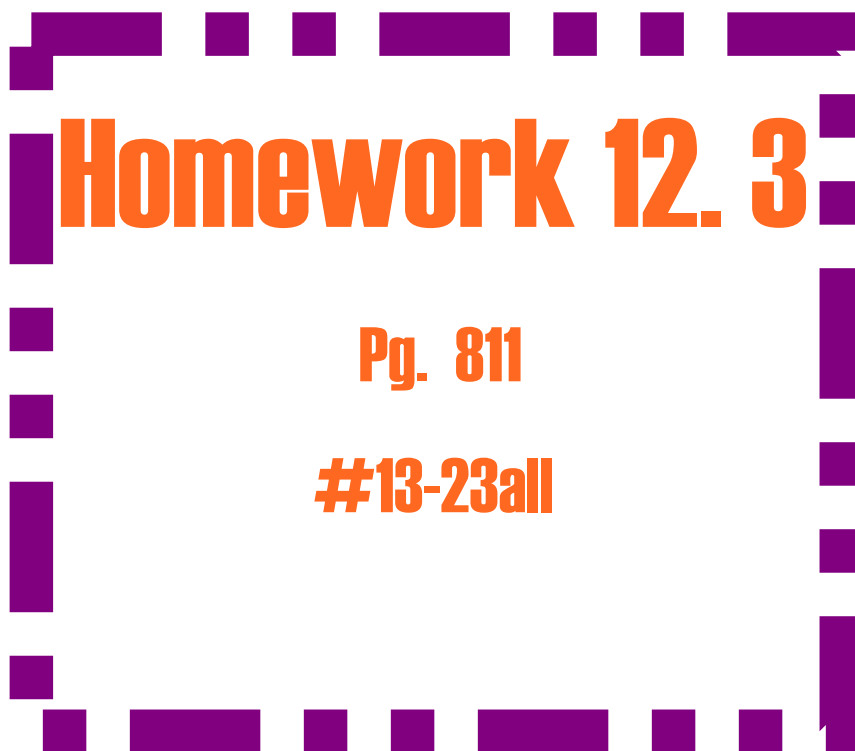
9. Sketch  $\frac{-5\pi}{6}$ . Then find its reference angle.



You Try!!

10. Sketch  $315^\circ$ . Then find its reference angle.

11. Sketch  $\frac{-3\pi}{4}$ . Then find its reference angle.



# Homework 12.3

Pg. 811

#13-23all