

Day 5

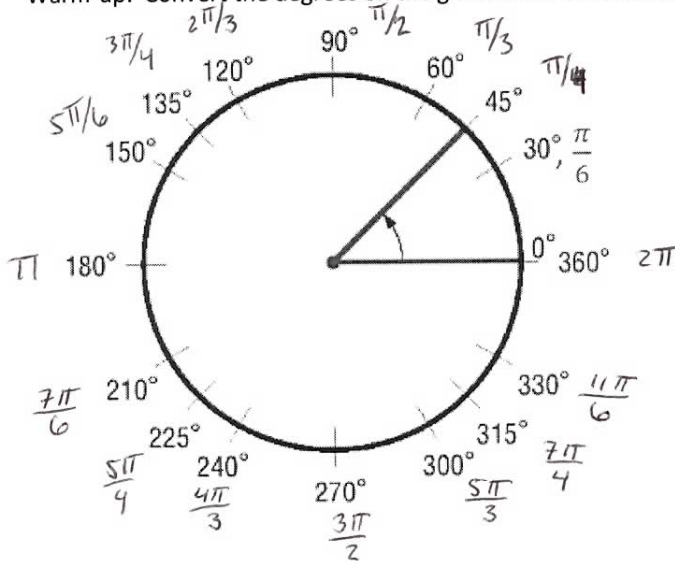
Friday, October 13, 2017
9:09 AM

10/13
4.3 unit circle
Worksheet



Precalculus
Notes 4-3 ...

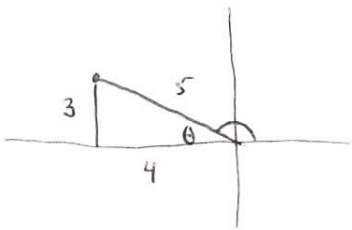
Warm-up: Convert the degrees on the given circle to radians. Write the radian measure next to the degree.



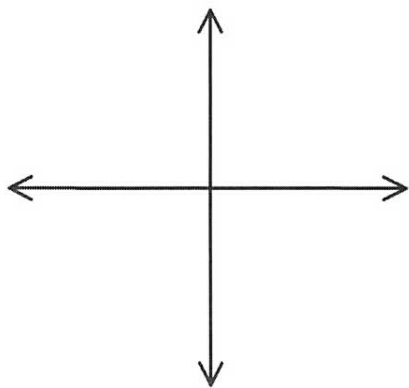
Homework Questions?

Today's Objectives:

Let $(-4, 3)$ be a point on the terminal side of an angle θ in standard position. Find the exact values of the six trigonometric functions of θ .



$$\begin{aligned} \sin \theta &= 3/5 & \csc \theta &= 5/3 \\ \cos \theta &= -4/5 & \sec \theta &= -5/4 \\ \tan \theta &= -3/4 & \cot \theta &= -4/3 \end{aligned}$$



$$\sin \theta =$$

$$\sec \theta =$$

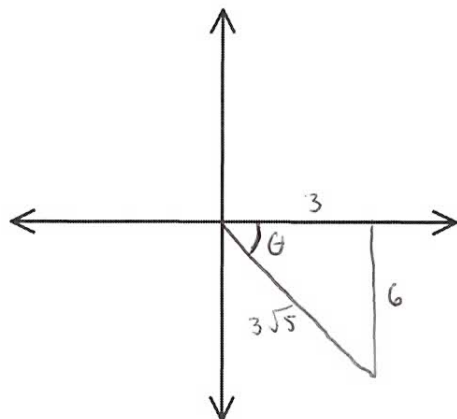
$$\cos \theta =$$

$$\csc \theta =$$

$$\tan \theta =$$

$$\cot \theta =$$

Let $(3, -6)$ be a point on the terminal side of an angle θ in standard position. Find the exact values of the six trigonometric functions of θ .



$$\sin \theta = \frac{6}{3\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{6\sqrt{5}}{15} = \frac{2\sqrt{5}}{5}$$

$$\sec \theta = \frac{3\sqrt{5}}{3} = \sqrt{5}$$

$$\cos \theta = \frac{3}{3\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$\csc \theta = \frac{3\sqrt{5}}{6} = \frac{\sqrt{5}}{2}$$

$$\tan \theta = \frac{6}{3} = 2$$

$$\cot \theta = \frac{1}{2}$$

$$\begin{aligned} 3^2 + 6^2 &= x^2 \\ 45 &= x^2 \\ 3\sqrt{5} &= x \end{aligned}$$

- The unit circle is the circle of radius 1 that is centered at the origin.

- Equation $x^2 + y^2 = 1$
Unit Circle

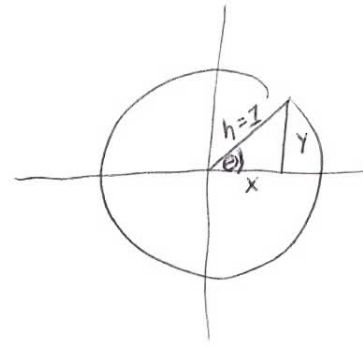
y x (alpha order) (\cos, \sin)
Sine and Cosine functions give the coordinates of a point in terms of its angle.

$$\cos \theta = \frac{x}{1} = x$$

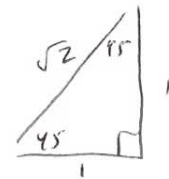
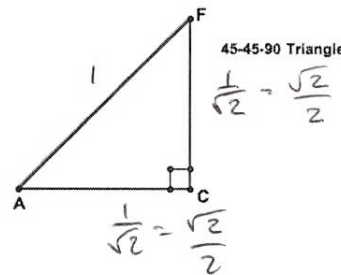
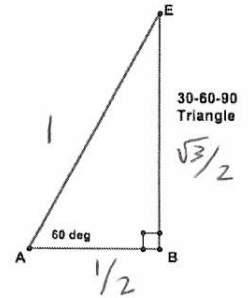
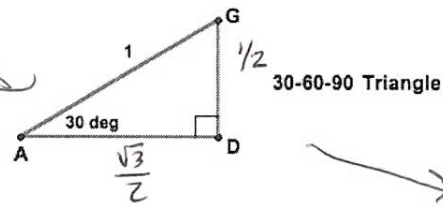
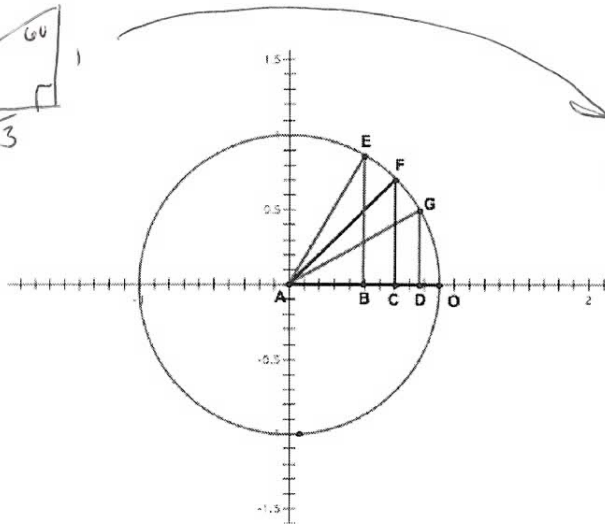
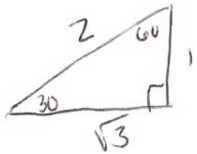
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$$\sin \theta = \frac{y}{1} = y$$

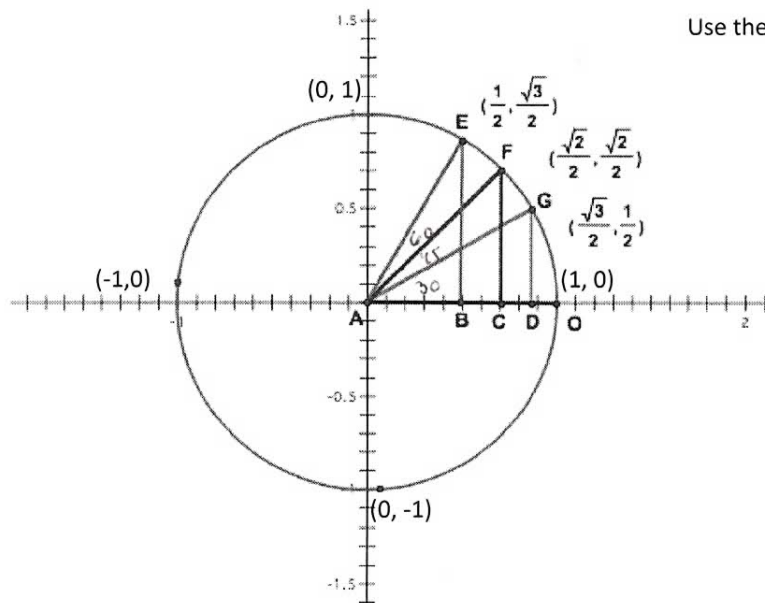
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We will use this idea to find the coordinates of key points on the unit circle.



Use the unit circle to find exact values of each trig function.



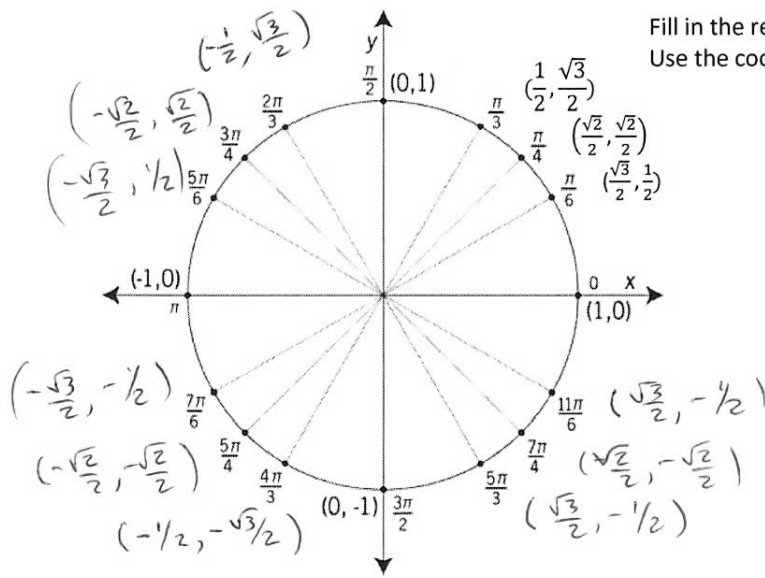
1st Quadrant

1. $\cos 30^\circ = \frac{\sqrt{3}}{2}$

2. $\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

3. $\cos 90^\circ = 0$

4. $\tan \frac{\pi}{3} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$
(60°)



Fill in the remaining coordinates for all angles.
Use the coordinates to find exact values for each trig function.

$$1. \sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$$

$$2. \cos \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$3. \tan \frac{3\pi}{2} = \frac{-1}{0} \text{ (undef.)}$$

You must be able to fill in this circle on Monday. You will be given a completed and blank version to study.

