

Determine the quadrant (I, II, III, or IV) in which

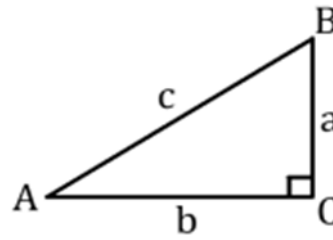
1. -200°	II
2. $\frac{5\pi}{4}$	III

Convert the angle from degrees to radians.

3. 240°	$4\pi/3$
4. 225°	$5\pi/4$

Convert the angle from radians to degrees.

5. $\frac{3\pi}{4}$	135°
6. $\frac{5\pi}{3}$	300°



10. $\sin B =$	b/c	13. $\sec A =$	c/b
11. $\cos B =$	a/c	14. $\csc A =$	c/a
12. $\tan B =$	b/a	15. $\cot A =$	b/a

Next to the term on the left, list all of the corresponding unit(s) listed below that could be used to describe it: inches, days, radians, feet/year, revolutions/second, degrees/hour, rotations, miles, centimeters, meters/month

7. linear speed	ft/yr, m/month
8. angular speed	rev/sec, deg/hour
9. arc length	in, mi, cm

Given that $s = r\theta$, $v = \frac{s}{t}$, $\omega = \frac{\theta}{t}$, $v = r\omega$, $5280 \text{ ft} = 1 \text{ mi}$

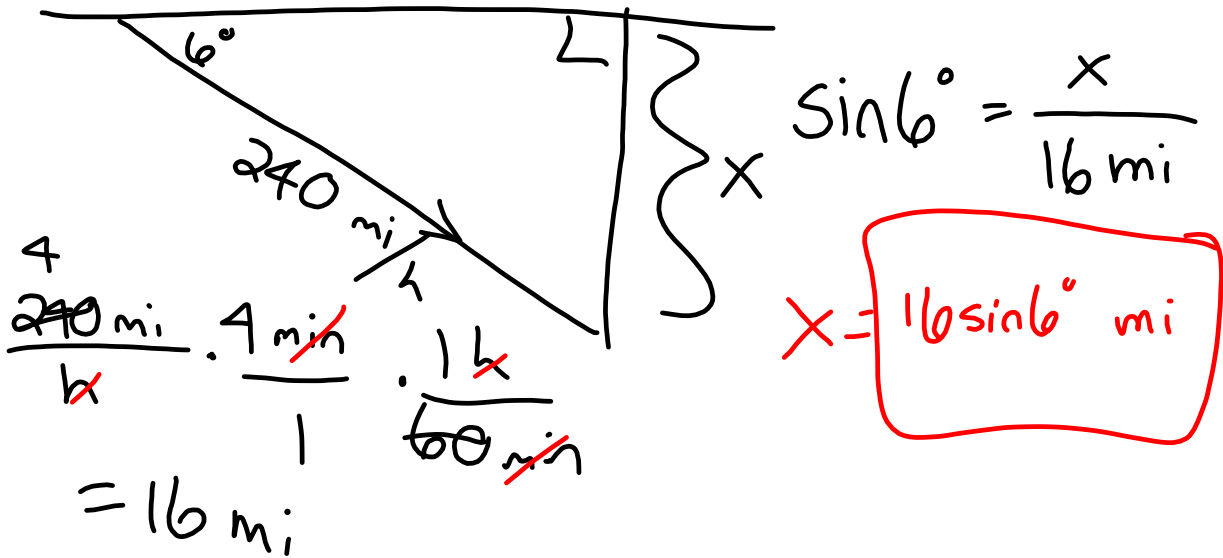
What is the linear speed, in miles per hour, of a car whose 24-inch diameter wheels spin at a rate of 264 revolutions per minute? Circle/box your exact, simplified final answer, including units.

$$v = ? \text{ mi/h}, \quad r = 12 \text{ in}, \quad \omega = \frac{264 \text{ rev}}{\text{min}}$$

$$v = \left(\frac{12 \text{ in}}{1}\right) \left(\frac{264 \text{ rev}}{\text{min}}\right) \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \cdot \frac{60 \text{ min}}{1 \text{ h}} \cdot \frac{2\pi}{1 \text{ rev}}$$

$$= \boxed{6\pi \text{ mi/h}}$$

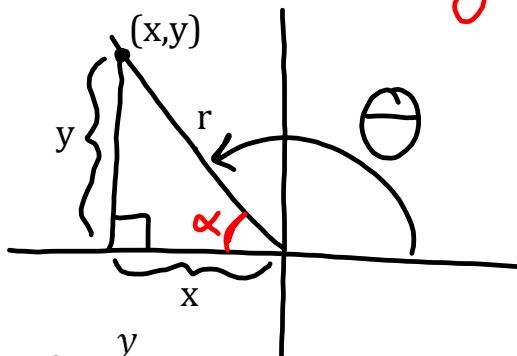
240 mph



5.3 - Trigonometric Functions of Any Angle

For an angle in standard position, the reference angle is the acute angle between the terminal side of the angle and the x-axis.

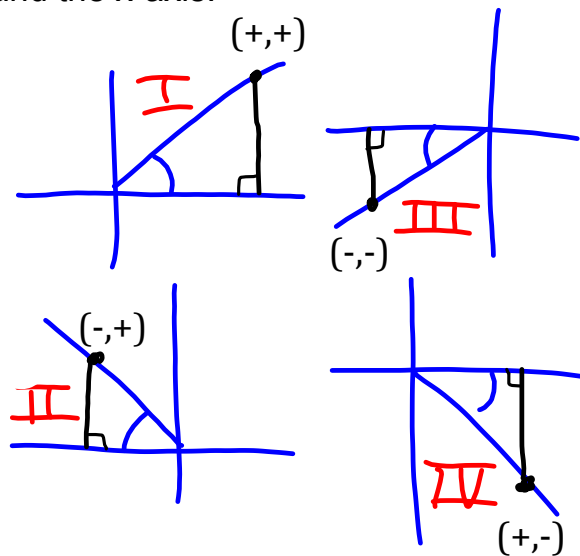
reference triangle



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

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

$\tan \theta = \frac{y}{x}$

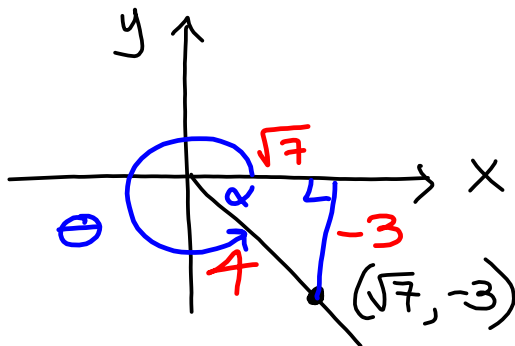


* note that the hypotenuse r is always positive, so that the x- and y-coordinates determine whether the trig function is positive or negative

<p>II</p> <p>Students</p> <p>only sine (and its reciprocal)</p>	<p>I</p> <p>All</p> <p>all functions are positive</p>
<p>III</p> <p>Take</p> <p>only tan (and its reciprocal)</p>	<p>IV</p> <p>Calculus</p> <p>only cosine (and its reciprocal)</p>

Tells us which functions are positive in which quadrants.

Find the 6 trigonometric function values of an angle whose terminal side passes through the given point.



$$\begin{aligned}
 h^2 &= (\sqrt{7})^2 + (-3)^2 \\
 h^2 &= 7 + 9 \\
 h^2 &= 16 \\
 h &= 4
 \end{aligned}$$

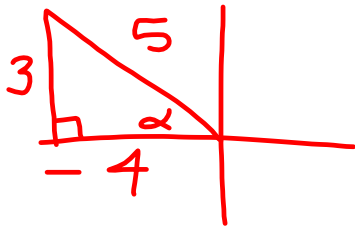
$$\sin \theta = -\frac{3}{4}$$

$$\cos \theta = \frac{\sqrt{7}}{4}$$

$$\cot \theta = -\frac{\sqrt{7}}{3}$$

$$\csc \theta = -\frac{4}{3}$$

36. Given that $\cos \alpha = -\frac{4}{5}$ and $\alpha \in QII$,
find the other 5 trigonometric function values of α .



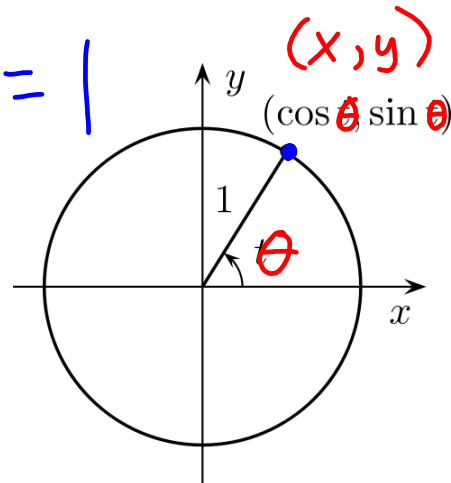
$$\tan \alpha = -\frac{3}{4}$$

$$\sec \alpha = -\frac{5}{4}$$

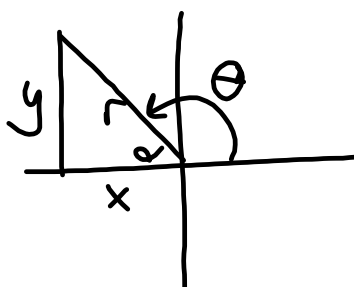
The unit circle and function values of 30°, 45°, and 60° reference angles

unit circle:
radius $r=1$
center $(0,0)$

$$x^2 + y^2 = 1$$



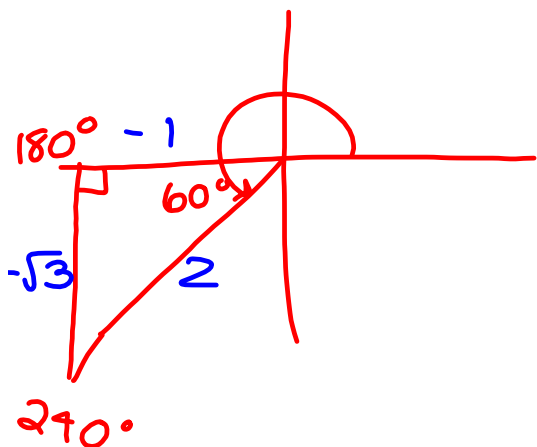
$(x-h)^2 + (y-k)^2 = r^2$
center: (h,k) ; radius: r



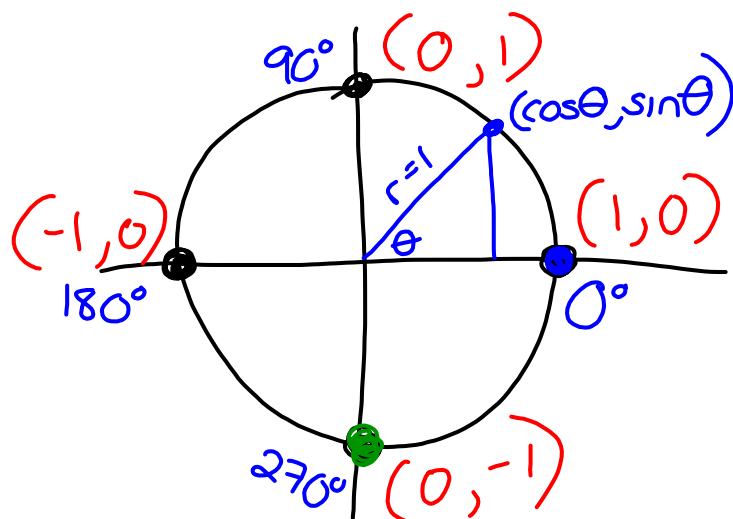
$$\sin \theta = \frac{y}{r} \quad y = r \sin \theta$$

$$\cos \theta = \frac{x}{r} \quad x = r \cos \theta$$

$$\sin 240^\circ = ? = \frac{-\sqrt{3}}{2}$$



What about quadrantal angles?



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

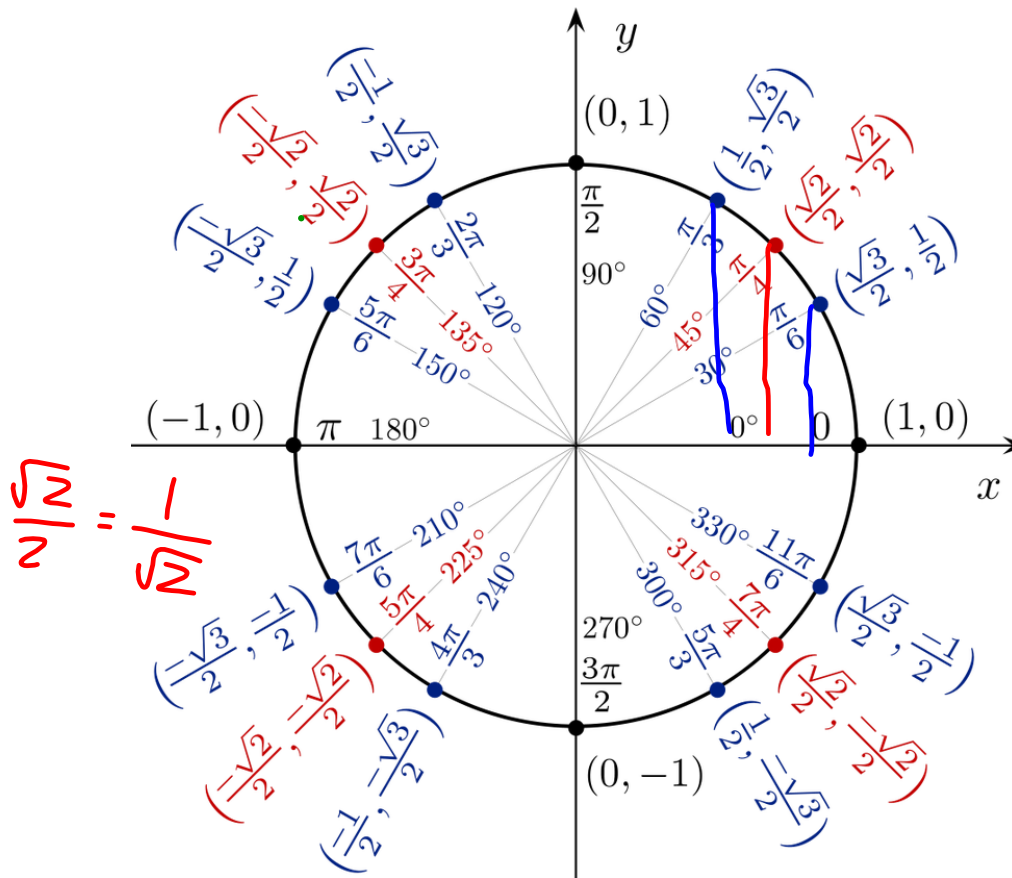
$$\csc \theta = \frac{1}{\sin \theta}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

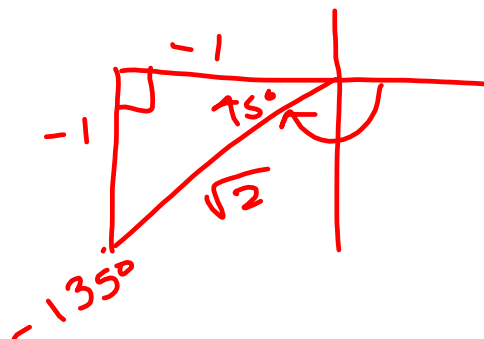
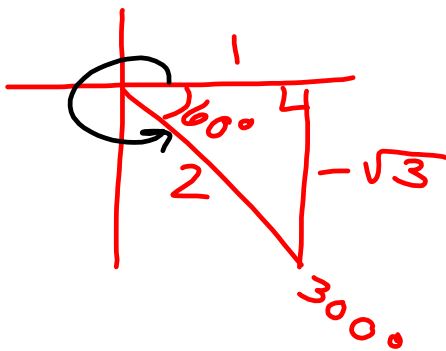
$$\tan 0^\circ = \frac{\sin 0^\circ}{\cos 0^\circ} = \frac{0}{1} = 0$$

$$\sec 270^\circ = \frac{1}{\cos 270^\circ} = \frac{1}{0} \text{ (undefined)}$$



Find the trig function value of the given angle (note that they all have either a 30° , 45° , or 60° reference angle OR are quadrantal angles).

$$\tan 300^\circ = \boxed{-\sqrt{3}} \quad \sec(-135^\circ) = \boxed{-\sqrt{2}}$$



Review:

A reference angle for an angle whose initial side is on the positive x-axis and terminal side may lie in any of the four quadrants is a cute.

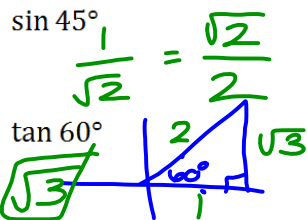
on either two axes

quadrantal



IDK...

Evaluate the following trigonometric expressions. Give exact answers. You do not have to rationalize. Draw a picture if this helps you.



$\sec 45^\circ = \sqrt{2}$

$\csc 30^\circ = 2$

$\sec(-270^\circ)$ *undefined*

$\cot(120^\circ) = -\frac{1}{\sqrt{3}}$

$\csc(-135^\circ) = -\sqrt{2}$

$\tan\left(\frac{540^\circ}{-360}\right) = \frac{\sin 180^\circ}{\cos 180^\circ} = \frac{0}{-1} = 0$

Due Wednesday, 8/20:

"Do you know enough Algebra..." take-home quiz

HW #2 due Friday 8/22:

- 5.2 #1-75 odd
- 5.3 #1-35 odd; 37-48 all; 61-68 all

Test #1 ~ Wed, 8/27