

Thursday, April 2, 2020

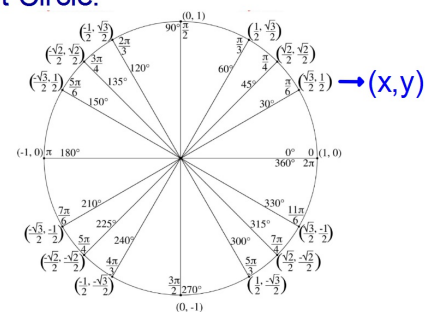
Sec 7-3: The Unit Circle and the Reciprocal Trig Functions.

Using the Unit Circle:

$$\sin \theta = y$$

$$\cos \theta = x$$

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

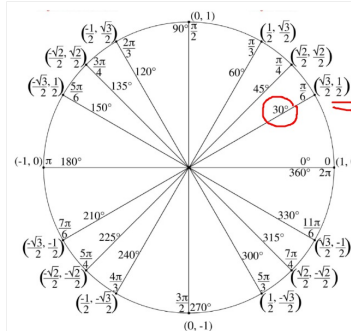


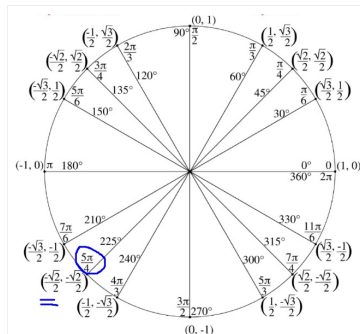
The Reciprocal Trig Functions:

$$\begin{aligned} \csc \theta &= \frac{1}{\sin \theta} = \frac{1}{y} \\ \sec \theta &= \frac{1}{\cos \theta} = \frac{1}{x} \\ \cot \theta &= \frac{1}{\tan \theta} = \frac{x}{y} \end{aligned}$$

Find the Exact Value.

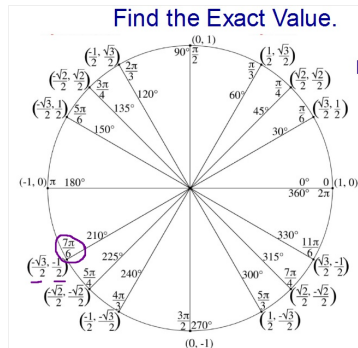
$$\begin{aligned} \csc 30^\circ &= \frac{1}{y} \text{ at } 30^\circ \\ &= \frac{1}{\frac{1}{2}} = 2 \end{aligned}$$





Find the Exact Value.

$$\begin{aligned}\sec \frac{5\pi}{4} &= \frac{1}{x} \text{ at } \frac{5\pi}{4} \\ &= \frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\ &= \frac{2\sqrt{2}}{-2} = \boxed{-\sqrt{2}}\end{aligned}$$



Find the Exact Value.

$$\cot \frac{19\pi}{6}$$

Find a coterminal angle on the Unit Circle.

$$\frac{19\pi}{6} - 2\pi =$$

$$\frac{19\pi}{6} - \frac{12\pi}{6} = \frac{7\pi}{6}$$

$$\cot \frac{19\pi}{6} = \cot \frac{7\pi}{6} = \frac{x}{y} \text{ at } \frac{7\pi}{6}$$

$$= \frac{-\sqrt{3}}{-\frac{1}{2}} = \frac{-\sqrt{3}}{-1} = \boxed{\sqrt{3}}$$

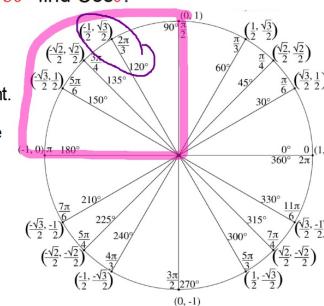
Use a given trig value to find another trig value and/or an unknown angle.

Given $\sin \theta = \frac{\sqrt{3}}{2}$ and $90^\circ \leq \theta \leq 180^\circ$ find $\cos \theta$.

1. $90^\circ \leq \theta \leq 180^\circ$ means θ is in the 2nd Quadrant.

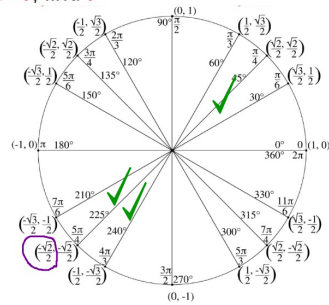
2. Remember, $\sin \theta$ is the y-coordinate
In the 2nd Quadrant the only y-coord that is $\frac{\sqrt{3}}{2}$ is when $\theta = 120^\circ$

3. Therefore, $\cos \theta = \boxed{-\frac{1}{2}}$
(the x-coord at 120°)



Given $\cos\theta = -\frac{\sqrt{2}}{2}$ and $\tan\theta > 0$, find θ

1. Since $\tan\theta = \frac{y}{x}$ and it is positive, x and y must have the same sign. θ must be in 1st or 3rd Quadrants
2. But, since $\cos\theta$ is negative, θ must be in 3rd Quadrant.
3. The only x-coord in the 3rd Quadrant that $= -\frac{\sqrt{2}}{2}$ is when $\theta = 225^\circ$



You can now work on Practice #14 which is posted on my blog.