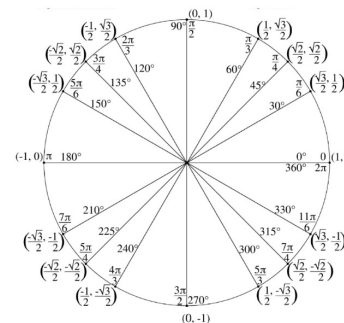


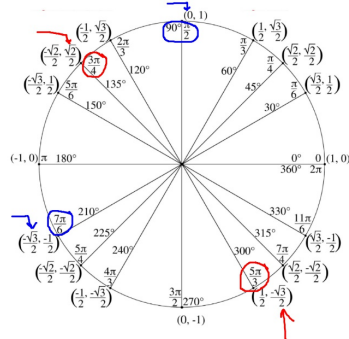
Wednesday, April 1, 2020

Sec 7-3: The Unit Circle - with Radians and Tangent.

The Unit Circle with Degrees and Radians:

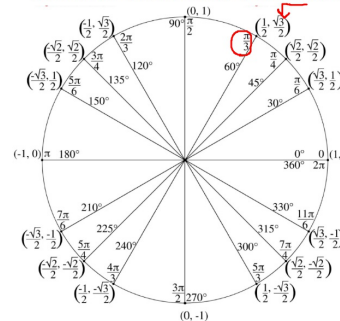


Find the EXACT value of each using the Unit Circle.



1. $\cos \frac{\pi}{2} = 0$
2. $\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$
3. $\cos \frac{7\pi}{6} = \frac{-\sqrt{3}}{2}$
4. $\sin \frac{5\pi}{3} = \frac{-\sqrt{3}}{2}$

The Unit Circle and Coterminal Angles:



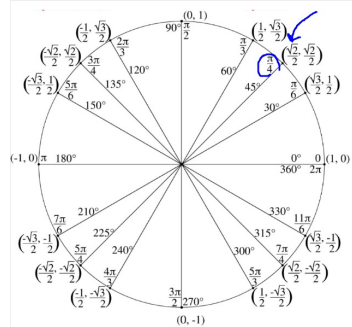
Find the EXACT value.

$$\sin \frac{7\pi}{3}$$

Find a coterminal angle on the Unit Circle:

$$\frac{7\pi}{3} - 2\pi = \frac{7\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3}$$

$$\sin \frac{7\pi}{3} = \sin \frac{\pi}{3} = \boxed{\frac{\sqrt{3}}{2}}$$



Find the EXACT value .

$$\cos \frac{-15\pi}{4}$$

Find a coterminal angle on the Unit Circle:

$$\frac{-15\pi}{4} + 2\pi = \frac{-15\pi}{4} + \frac{8\pi}{4} = \frac{-7\pi}{4}$$

$$\frac{-7\pi}{4} + 2\pi = \frac{-7\pi}{4} + \frac{8\pi}{4} = \frac{\pi}{4}$$

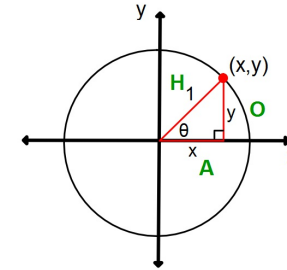
$$\cos \frac{-15\pi}{4} = \cos \frac{\pi}{4} = \frac{\sqrt{2}}{2}$$

Defining Tan on the Unit Circle.

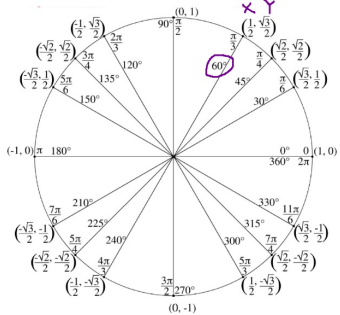
SOHCAH **TOA**

$$\tan \theta = \frac{\text{Opp}}{\text{Adj}} = \frac{y}{x}$$

Tan of any angle on the Unit Circle is the ratio of the y-coord to the x-coord.

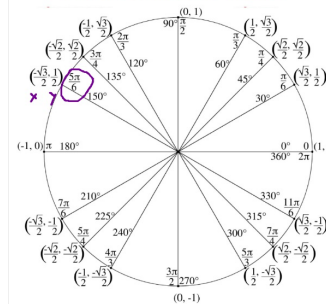


Find the EXACT value.



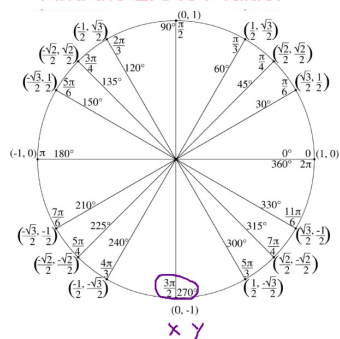
$$\tan 60^\circ = \frac{y}{x} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{1} = \sqrt{3}$$

Find the EXACT value.



$$\begin{aligned} \tan \frac{5\pi}{6} &= \frac{y}{x} = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} \\ &= \frac{1}{-\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3} \end{aligned}$$

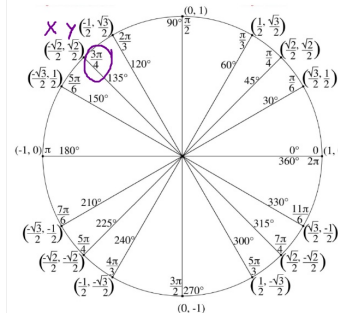
Find the EXACT value.



$$\tan 270^\circ = \frac{y}{x} = \frac{-1}{0}$$

$$= \text{Undefined}$$

Find the EXACT value. $\tan \frac{-5\pi}{4}$ Find a coterminal angle on the Unit Circle:



$$\frac{-5\pi}{4} + 2\pi$$

$$= \frac{-5\pi}{4} + \frac{8\pi}{4} = \frac{3\pi}{4}$$

$$\tan \frac{-5\pi}{4} = \tan \frac{3\pi}{4}$$

$$= \frac{y}{x} = \frac{\frac{\sqrt{3}}{2}}{\frac{-1}{2}} = -1$$

You can now work on Practice #13 which is posted on my blog.