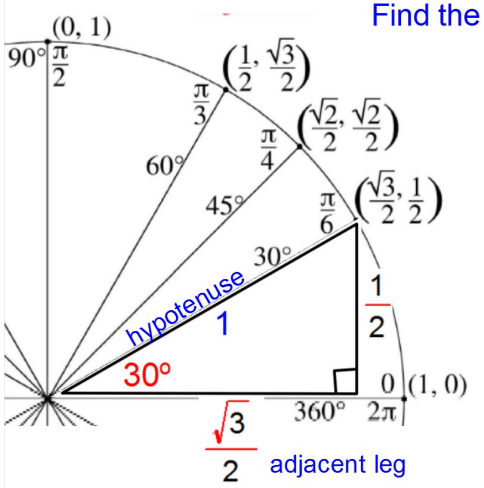
Coordinates of points on the Unit Circle
can be used to find the Exact Value of
Sin, Cos, and Tan of angles on the Unit Circle.

You will have a quiz just over filling out the Unit Circle!

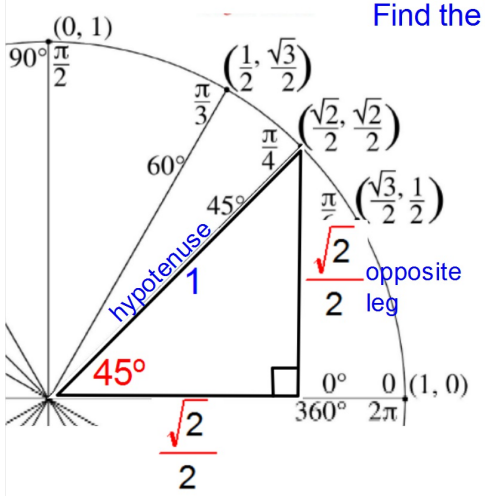
Monday, February 26



Find the Exact value of each.

$\cos\theta = \frac{adj}{hyp}$

$\cos 30° = \frac{\frac{\sqrt{3}}{2}}{1} = \frac{\sqrt{3}}{2}$

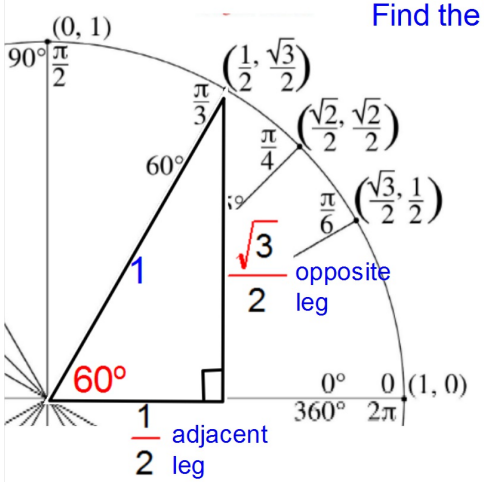


Find the Exact value of each.

$\sin\theta = \frac{opp}{hyp}$

$\sin 45° = \frac{\frac{\sqrt{2}}{2}}{1} = \frac{\sqrt{2}}{2}$

Find the Exact value of each.



$\text{Tan}\theta = \frac{\text{OPP}}{\text{adj}}$

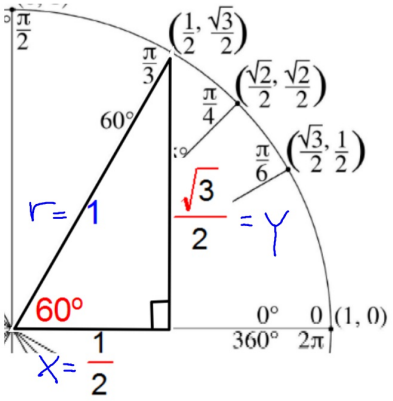
$\text{Tan}60^\circ = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$

Definitions of Sin,Cos, and Tan using the Unit Circle:

$\text{Cos}\theta = \frac{\text{Adj}}{\text{Hypot}} = \frac{x}{r} = \frac{x}{1} = x$

$\text{Sin}\theta = \frac{\text{Opp}}{\text{Hypot}} = \frac{y}{r} = \frac{y}{1} = y$

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



$\text{Cos}\theta = \frac{\text{Adj}}{\text{Hypot}} = \frac{x}{r} = \frac{x}{1} = x$

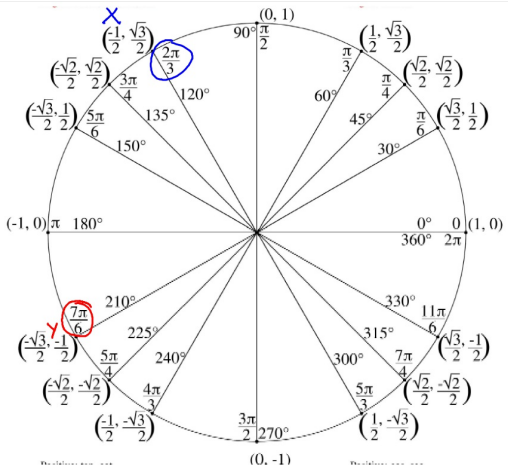
Cos of any angle on the unit circle is just the x-coordinate of the point associated with that angle.

$\text{Sin}\theta = \frac{\text{Opp}}{\text{Hypot}} = \frac{y}{r} = \frac{y}{1} = y$

Sin of any angle on the unit circle is just the y-coordinate of the point associated with that angle.

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

Tan of any angle on the unit circle is just the ratio of the y-coordinate to the x-coordinate of the point associated with that angle.



Use the Unit Circle to find the EXACT value of each.

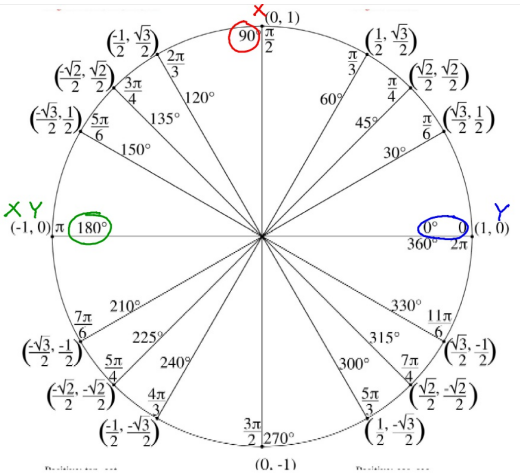
$\text{Cos}\frac{2\pi}{3} = -\frac{1}{2}$

$\text{Sin}\frac{7\pi}{6} = -\frac{1}{2}$

Coordinates on the Unit Circle:

$$(x, y) \longrightarrow (\cos\theta, \sin\theta)$$

$$\text{Tan}\theta = \frac{y}{x} = \frac{\text{Sin}\theta}{\text{Cos}\theta}$$

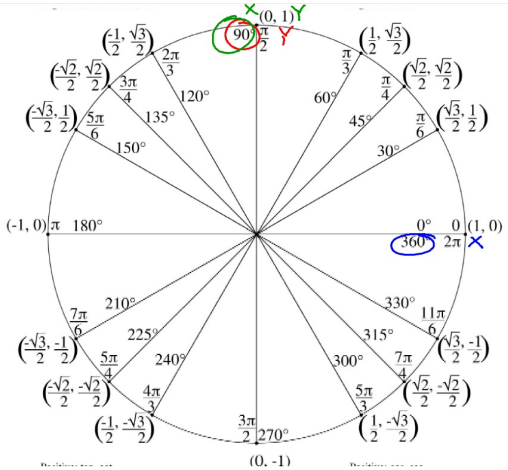


Use the Unit Circle to find the EXACT value of each.

Sin0 = 0

Cos90° = 0

Tan180° = $\frac{0}{-1}$ = 0



Use the Unit Circle to find the EXACT value of each.

Sin90° = 1

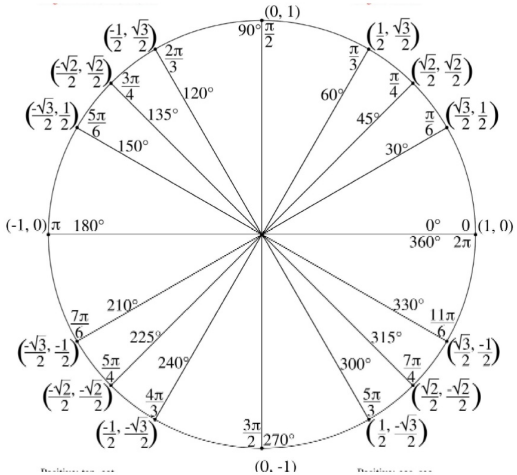
Cos720° =

720 - 360 = 360

= cos360° = 1

Tan90° = $\frac{1}{0}$

= undefined



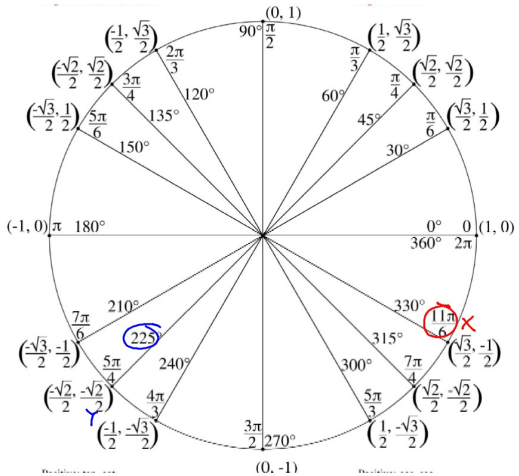
Sin(−135°) = $-\frac{\sqrt{2}}{2}$

Sin(225°)

Cos660°

− 360

Cos 300° = $\frac{1}{2}$



Cos $\frac{23\pi}{6}$

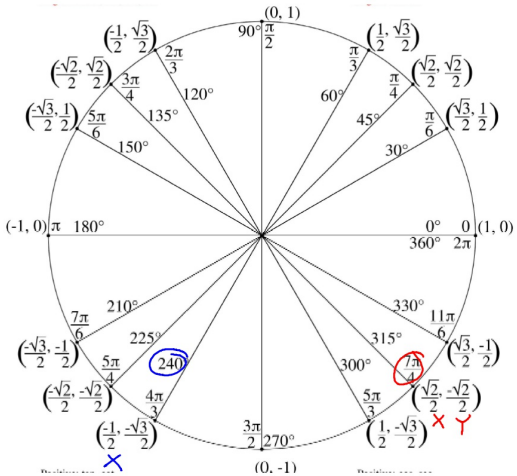
$\frac{23\pi}{6} - \frac{12\pi}{6} = \frac{11\pi}{6}$

$= \cos\frac{11\pi}{6} = \frac{\sqrt{3}}{2}$

Sin945°

945 - 360 - 360 = 225

= sin 225° = $-\frac{\sqrt{2}}{2}$



Tan$(-\frac{\pi}{4})$

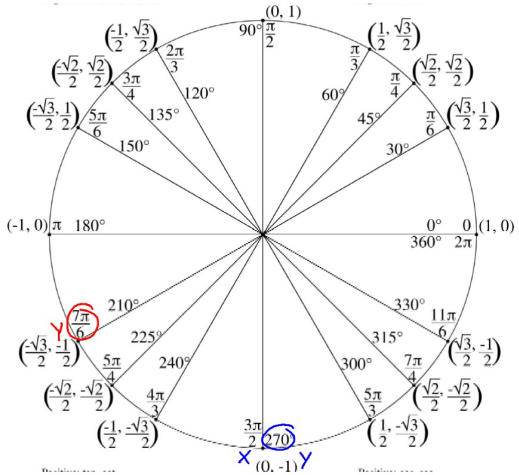
$-\frac{\pi}{4} + \frac{8\pi}{4} = \frac{7\pi}{4}$

Tan(7π/4) = $\frac{-\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1$

Cos(−480°)

−480 + 360 + 360 = 240

= cos(240°) = $-\frac{1}{2}$



$$\text{Sin}\left(-\frac{17\pi}{6}\right)$$

$$-\frac{17\pi}{6}+\frac{12\pi}{6}+\frac{12\pi}{6}=\frac{7\pi}{6}$$

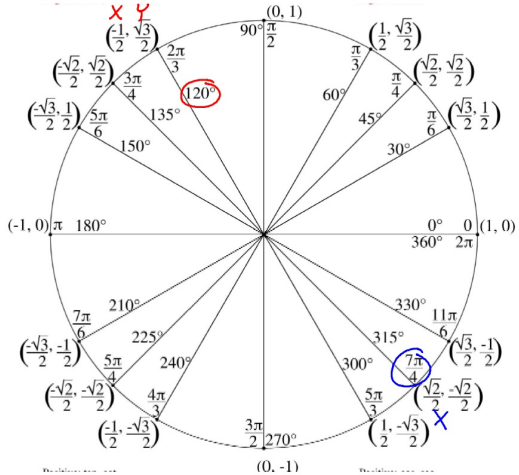
$$=\sin\left(\frac{7\pi}{6}\right)=-\frac{1}{2}$$

$$\text{Tan}630^\circ$$

$$630-360$$

$$=\text{Tan}\,270^\circ=\frac{-1}{0}$$

$$=\text{undefined}$$



$$\text{Tan}840^\circ$$

$$-720$$

$$=\text{Tan}\,120^\circ=\frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}}$$

$$=-\sqrt{3}$$

$$\text{Cos}\left(\frac{23\pi}{4}\right)$$

$$\frac{23\pi}{4}-\frac{8\pi}{4}-\frac{8\pi}{4}$$

$$=\cos\left(\frac{7\pi}{4}\right)=\frac{\sqrt{2}}{2}$$