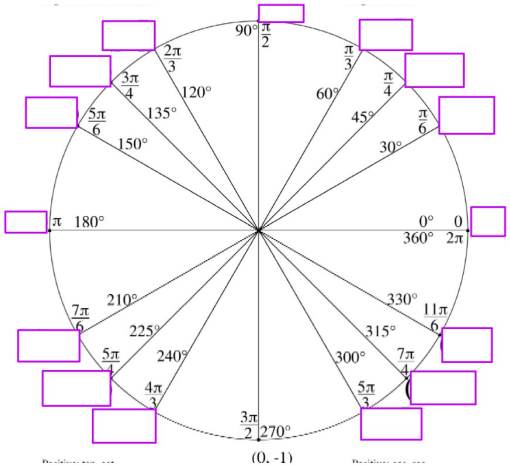
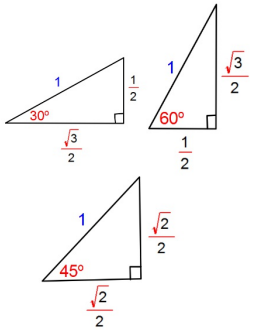
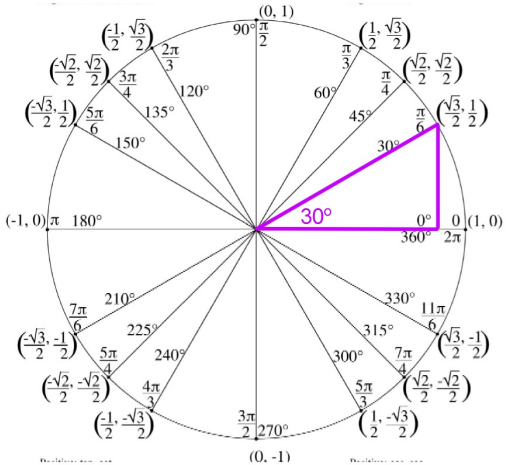
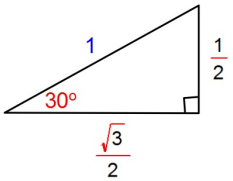


The angles on the Unit Circle are related to the following Special Right Triangles.

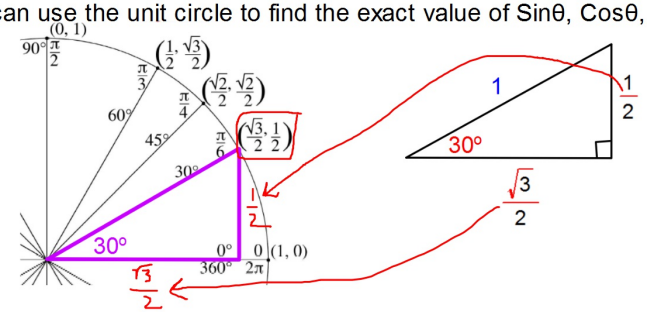




For example 30° on the Unit Circle relate to the following 30-60-90 triangle.



You can use the unit circle to find the exact value of Sinθ, Cosθ, and Tanθ



Cosθ = the x-coordinate

Cos 30° = $\frac{\sqrt{3}}{2}$

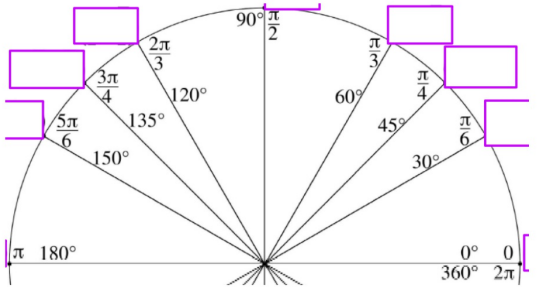
Sinθ = the y-coordinate

Sin 30° = $\frac{1}{2}$

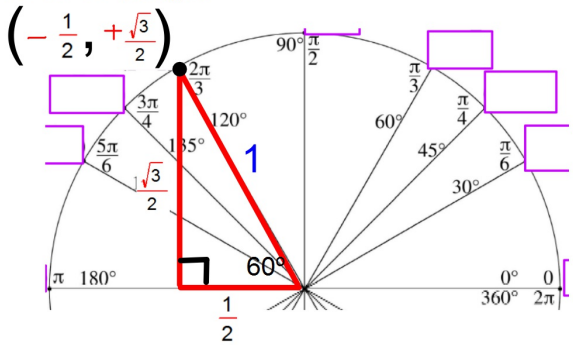
Tanθ = $\frac{y}{x}$

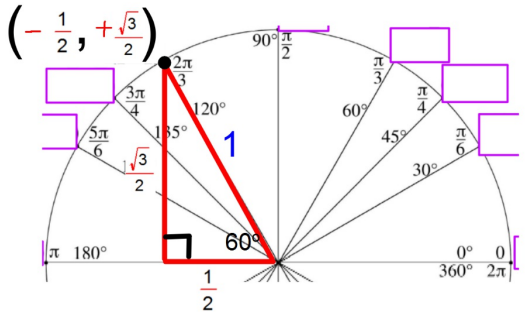
Tan 30° = $\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

To find the coordinates of the point at 120° draw a line down to the x-axis to create a 30-60-90 triangle.



To find the coordinates of the point at 120° draw a line down to the x-axis to create a 30-60-90 triangle.



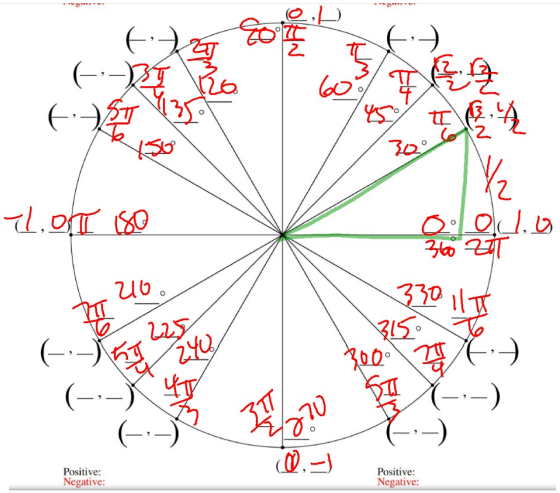


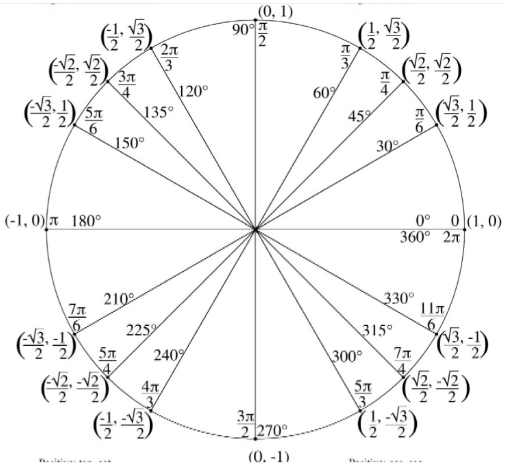
find the exact value of each:

1. Cos120° $-\frac{1}{2}$
2. Sin120° $\frac{\sqrt{3}}{2}$
3. Tan120° $\frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\frac{\sqrt{3}}{1} = -\sqrt{3}$

Fill out the entire Unit Circle.

Do as much as you can on your own.





You will have a quiz over just the Unit Circle next week some time.

Find the EXACT value of each.

1. Cos $\frac{29\pi}{3}$

$\frac{29\pi}{3}$ Is coterminal with $\frac{5\pi}{3}$

$\cos\frac{29\pi}{3} = \cos\frac{5\pi}{3}$

$= \frac{1}{2}$

2. Sin $\frac{37\pi}{4}$

$\frac{37\pi}{4}$ Is coterminal with $\frac{5\pi}{4}$

$\sin\frac{37\pi}{4} = \sin\frac{5\pi}{4}$

$= -\frac{\sqrt{2}}{2}$

3. Tan $\frac{57\pi}{2}$

$\frac{57\pi}{2}$ Is coterminal with $\frac{\pi}{2}$

$\tan\frac{57\pi}{2} = \tan\frac{\pi}{2} = \frac{1}{0}$

= undefined

Find the EXACT value of each.

4. Cos $\left(\frac{-11\pi}{2}\right)$

same as $\cos\frac{\pi}{2}$

$= 0$

$-\frac{11\pi}{2}$ Is coterminal with $\frac{\pi}{2}$

5. Sin 96π

96π Is coterminal with 0

$\sin 96\pi = \sin 0$

$= 0$

6. Tan $\left(\frac{-79\pi}{6}\right)$

$-\frac{79\pi}{6}$ Is coterminal with $\frac{5\pi}{6}$

$\tan\left(\frac{-79\pi}{6}\right) = \tan\frac{5\pi}{6}$

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

Use the given infomation to find the measure of all the anlges θ that meet each condition.

θ in degrees $(0° \le \theta \le 360°)$

1. $\cos\theta = -\frac{1}{2}$

$120°, 240°$

Find the angles where the x-coord is -1/2

2. $\sin\theta = \frac{\sqrt{2}}{2}$

$45°, 135°$

Find the angles where the y-coord is $\frac{\sqrt{2}}{2}$

3. $\cos\theta = 1$

$0, 360°$

Find the angles where the x-coord is 1

4. $\sin\theta = -\frac{\sqrt{3}}{2}$

$240°, 300°$

Find the angles where the y-coord is $-\frac{\sqrt{3}}{2}$

5. $\sin\theta = 0$

$0, 180, 360$

Find the angles where the y-coord is 0

Use the given infomation to find the measure of all the anlges θ that meet each condition.

θ in degrees ($0° \leq \theta \leq 360°$)

6. $\tan\theta = -1$ $135°, 315°$

Find all angles where the x and y coord are the same numbers but different signs.

7. $\tan\theta = \sqrt{3}$ $= 60, 240°$

Since Tan is the ratio of y/x y must be $\frac{\sqrt{3}}{2}$ and x must be $\frac{1}{2}$ and they must have the same sign in order to reduce to $\sqrt{3}$

8. $\tan\theta = -\frac{\sqrt{3}}{3}$ $150, 330°$

Since Tan is the ratio of y/x y must be $\frac{1}{2}$ and x must be $\frac{\sqrt{3}}{2}$ and they must have different signs in order to reduce to $\frac{1}{\sqrt{3}}$ which will rationalize to become $-\frac{\sqrt{3}}{3}$