

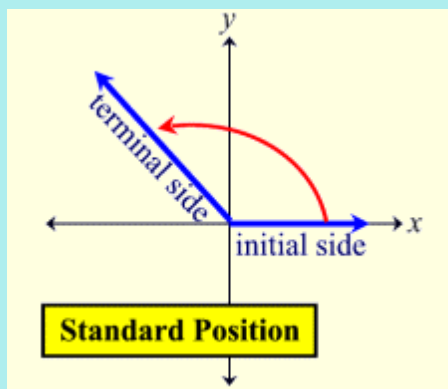
Unit 5

Learning Target 5.1: I can convert angles from radians to degrees and vice versa

Let's review first

Standard Position

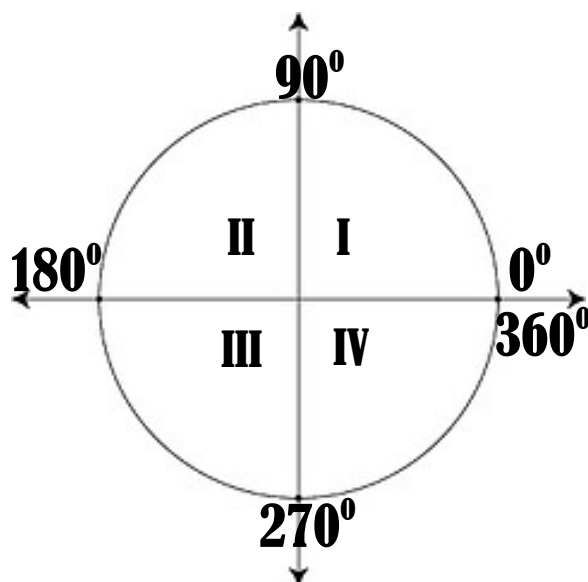
An angle is in standard position if its vertex is located at the origin and one ray is on the positive side of the x-axis.



Quadrantal Angle

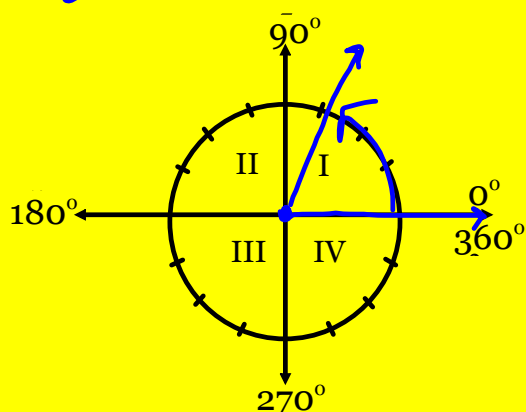
If the terminal side of an angle lies "on" the axes

(0° , 90° , 180° , 270° , 360°)



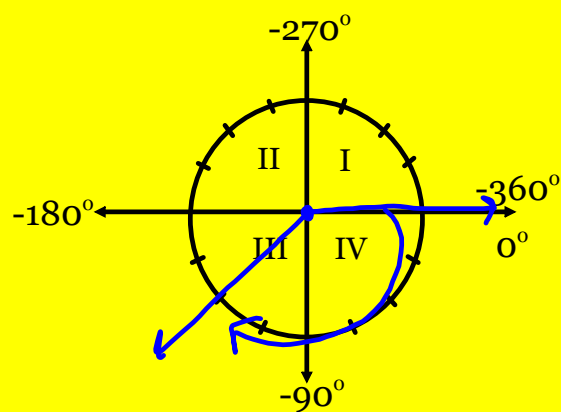
Positive Angles

Counterclockwise

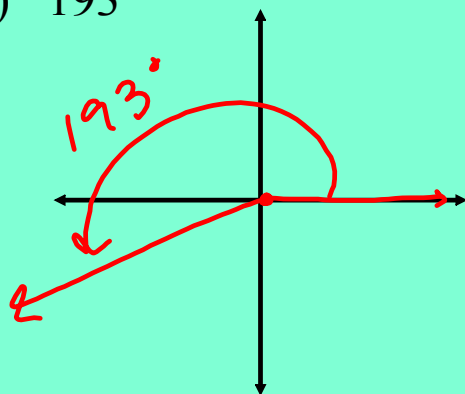
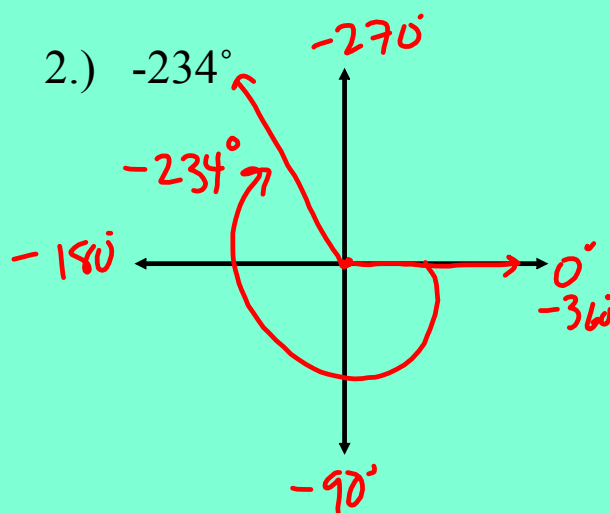


Negative Angles

Clockwise

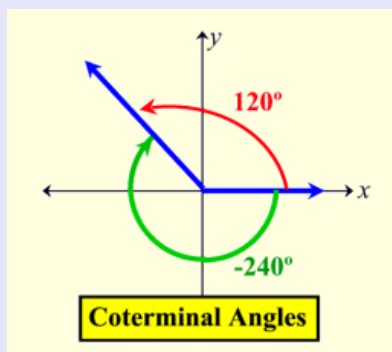


Draw each angle in standard position. Be sure to use arrows to indicate direction.

1.) 193° 2.) -234° 

Co-terminal Angles

If two angles in standard position have the same terminal side, they are called co-terminal angles.



If measured in a **counterclockwise** direction the measurement is **positive**.

If measured in a **clockwise** direction the measurement is **negative**.

Find one positive and one negative co-terminal angle.

$$3.) \quad 56^\circ + 360^\circ$$

$$\text{pos: } \underline{416^\circ}$$

$$\text{neg: } \underline{-304^\circ}$$

$$4.) \quad 953^\circ$$

$$\text{pos: } \underline{1313^\circ}$$

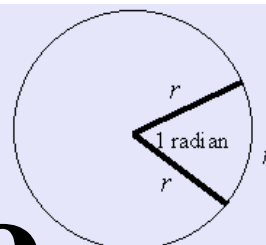
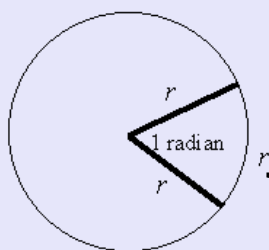
$$\text{neg: } \underline{-127^\circ}$$

Determine whether the following pairs of angles are coterminal.

5.) $-36^\circ, 1036^\circ$



6.) $85^\circ, 805^\circ$



**Now, on to
Radians**

One Radian

angle we get when we rotate
around a circle to the point where
the arc length equals the radius.

(1 radian \approx 57.3 $^\circ$)

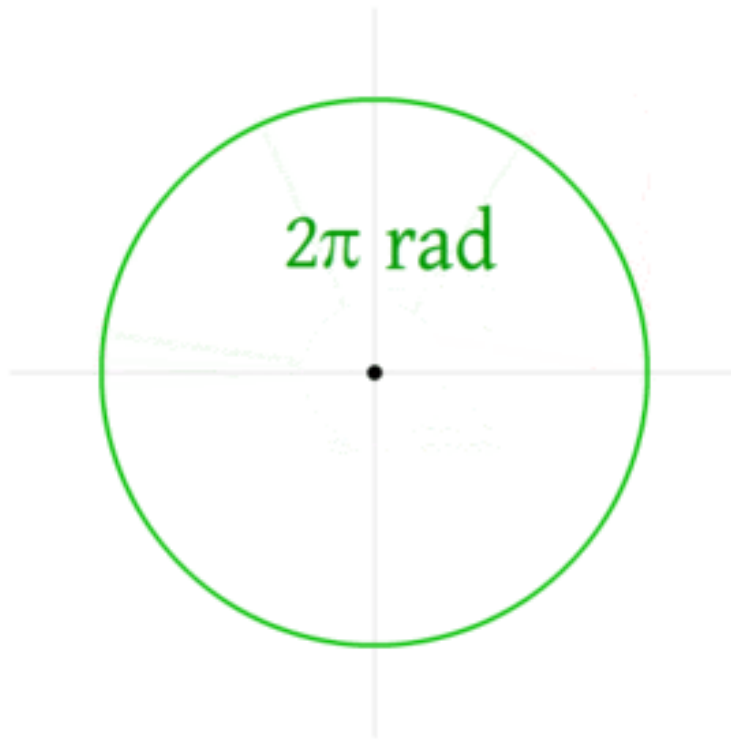
Radian is a unitless measurement.

The word radian is not needed.

$$\theta = 2^\circ \quad \neq \quad \theta = 2$$

$^\circ$ means degrees.

Nothing means **RADIANS!**



Therefore, one circle =

$$360^\circ = 6.28\dots = 2\pi$$

What do you think 180° is in radians?

$$180^\circ = \pi$$

We use this to convert between degrees and radians

Converting Degrees to Radians

$$d^\circ \cdot \frac{\pi}{180^\circ}$$

$$1.) \frac{90^\circ}{1} \cdot \frac{\pi}{180^\circ} = \frac{90\pi}{180}$$

$$= \boxed{\frac{1\pi}{2}}$$

$$2.) -145^\circ \cdot \frac{\pi}{180^\circ}$$

$$= \frac{-145\pi}{180} = \boxed{\frac{-29\pi}{36}}$$

3.) -45°

4.) 265°

Converting Radians to Degrees

$$r \cdot \frac{180^\circ}{\pi}$$

5.) $\frac{2\pi}{3} \cdot \frac{180^\circ}{\pi}$

$$\frac{360^\circ}{3} = \boxed{120^\circ}$$

6.) $\frac{4}{1} \cdot \frac{180^\circ}{\pi} = \boxed{\frac{720^\circ}{\pi}}$
$$= \boxed{229.18^\circ}$$

$$7.) -\frac{5\pi}{3}$$

$$8.) -1.5$$