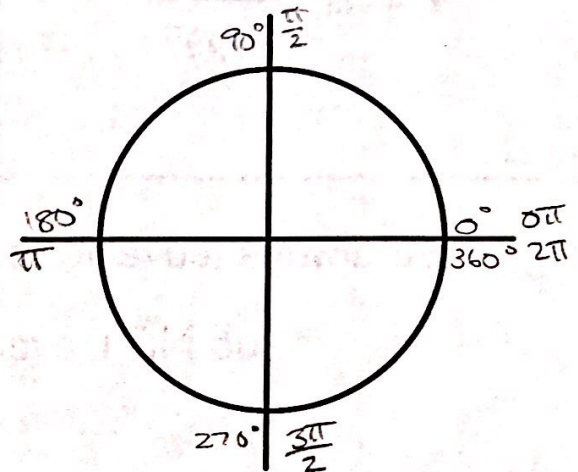


# Converting Angle Measure

A radian is just another way to measure an angle. A radian is associated with the radius length of a circle.

[click dot and scroll down for Radian Animation](#) :

A circle has 360 degrees or  $2\pi$  radians, which is approximately 6.28 radians.



**Examples:** Find the measure of each angle.

a) **Positive Angle**

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

b) **Negative Angle**

$$2\pi - \frac{19\pi}{12} = \frac{24\pi}{12} - \frac{19\pi}{12} = \frac{5\pi}{12}$$

$$-\frac{5\pi}{12}$$

c) **Negative Angle**

$$\pi - \frac{\pi}{6} = \frac{6\pi}{6} - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$-\frac{5\pi}{6}$$

d) **Positive Angle**

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

## Converting Angle Measures

degrees to radians

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

radians to degrees

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

We always leave  $\pi$  as  $\pi$  when converting ...

do NOT evaluate for  $\pi$  !

### Examples:

a) Convert  $30^\circ$  to radians.

$$r = 30^\circ \cdot \frac{\pi}{180^\circ}$$

$$r = \frac{30^\circ \pi}{180^\circ}$$

$$r = \frac{\pi}{6}$$

b) Convert  $\frac{4\pi}{9}$  to degrees.

$$d = \frac{4\pi}{9} \cdot \frac{180^\circ}{\pi} = 80^\circ$$