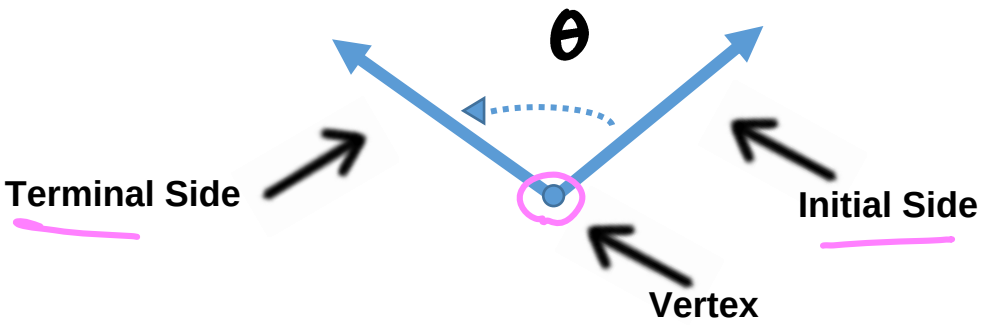
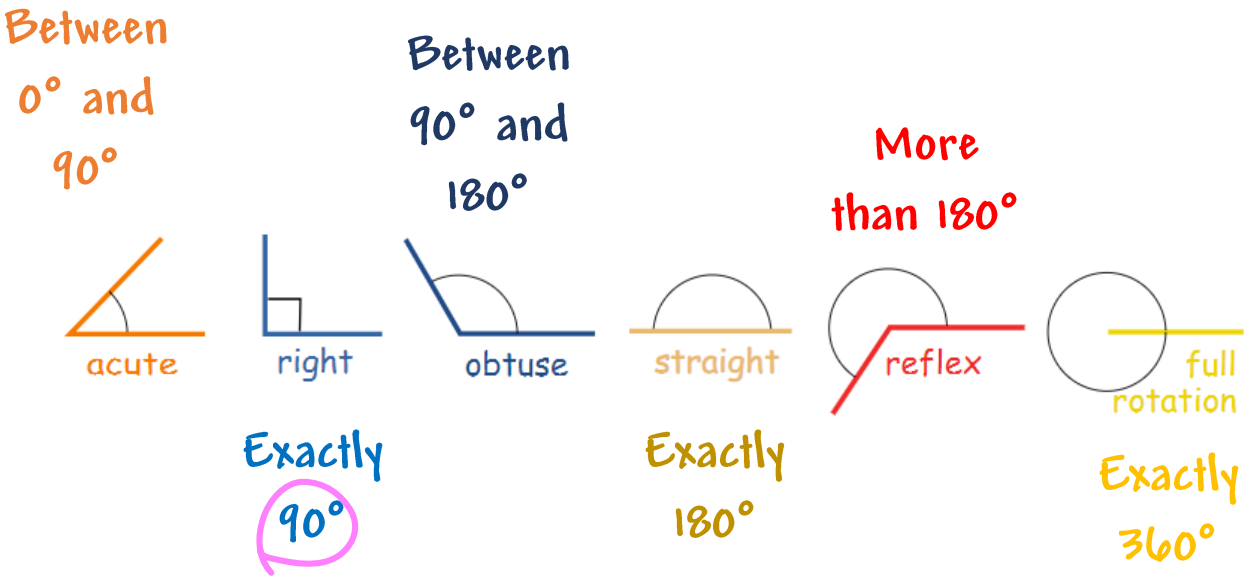
Intro Angles

An angle is formed by two rays (or lines) that have a common endpoint. One ray is called the initial side and the other the terminal side.

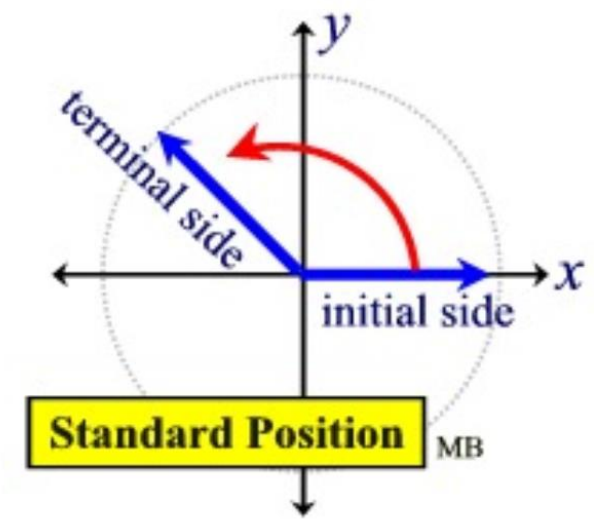
start

end



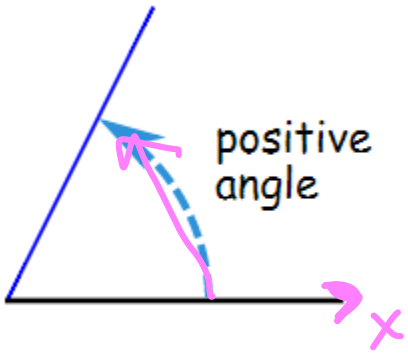


Standard Position Angles

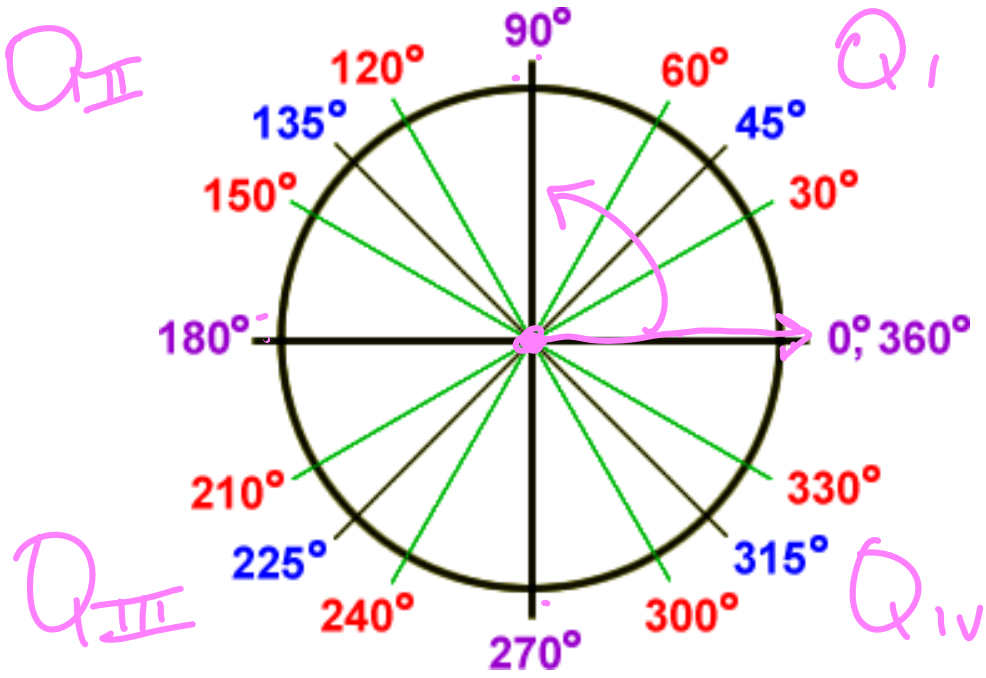


- **Vertex at the origin**

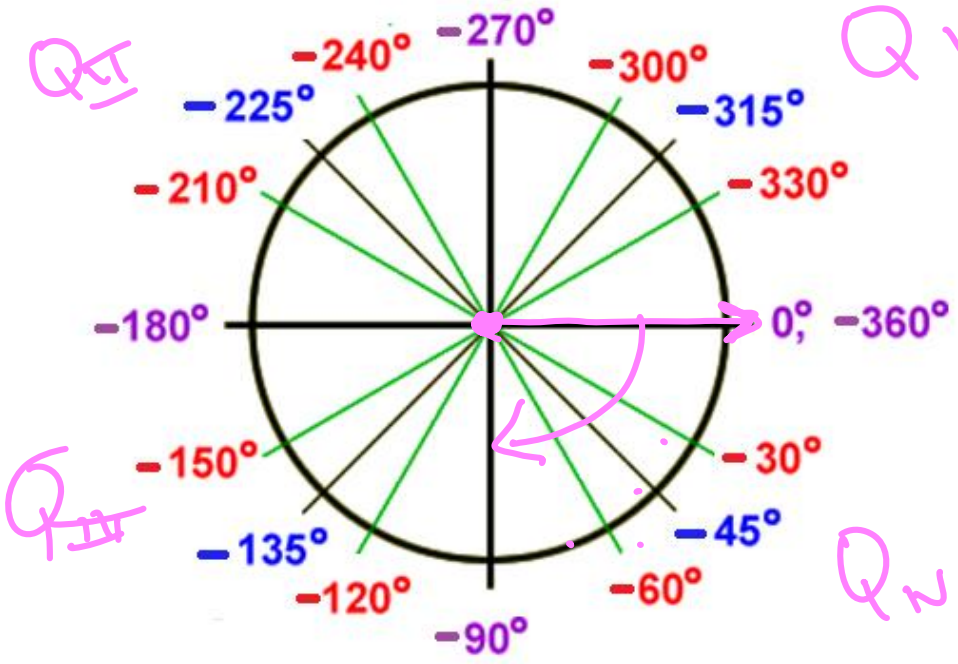
- **Initial side on positive x-axis.**



These are all positive angles

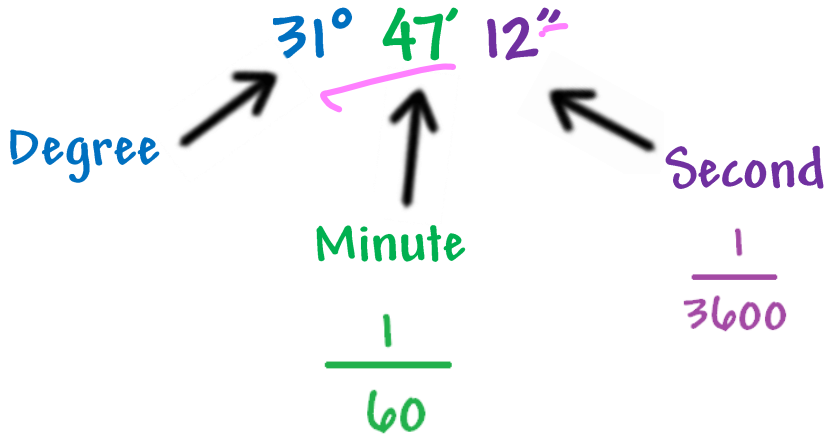


These are all negative angles



Degree Minute Second

Not all angles are whole values so we need to be able to talk about those fractional angles also like 35.75° and 176.6°

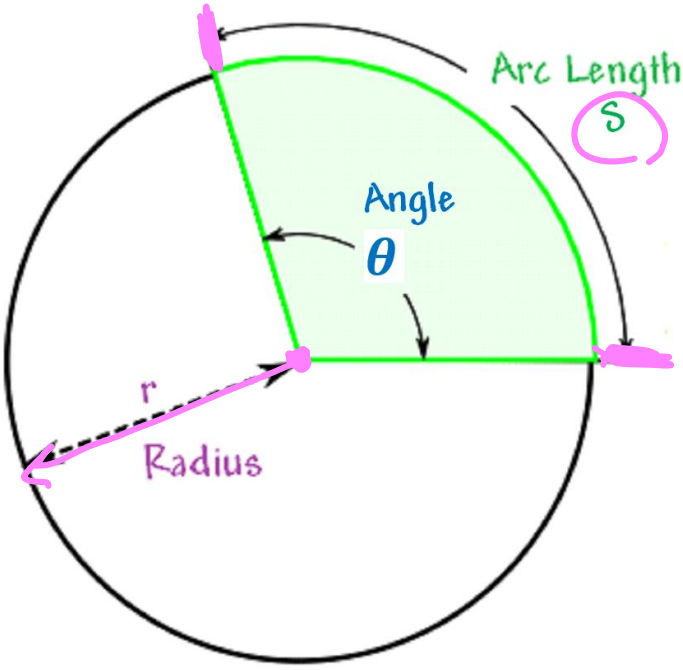


$$= 31° + \frac{47}{60} + \frac{12}{3600}$$

You can use your calculator to find the exact value or work it out by hand

$$= 31.7866°$$

Arc Length



If you want to find the Arc Length all you need is the

ANGLE and the RADIUS

Radians

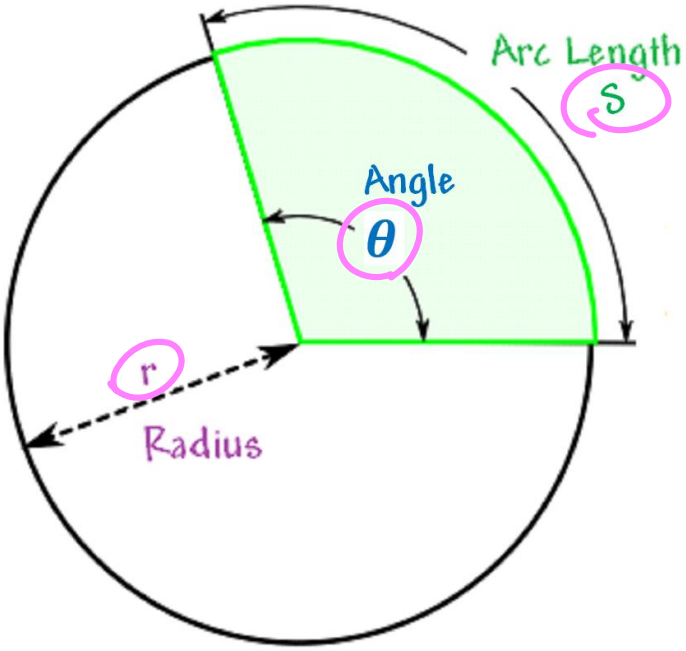
Arc Length = θr

$$\theta = \frac{S}{r}$$

Degrees

Arc Length = $\theta(180)r$

$$\theta = \frac{S}{180r}$$



If you want to find the THETA (Central Angle) all you need is the

Arc Length and the RADIUS

Radians

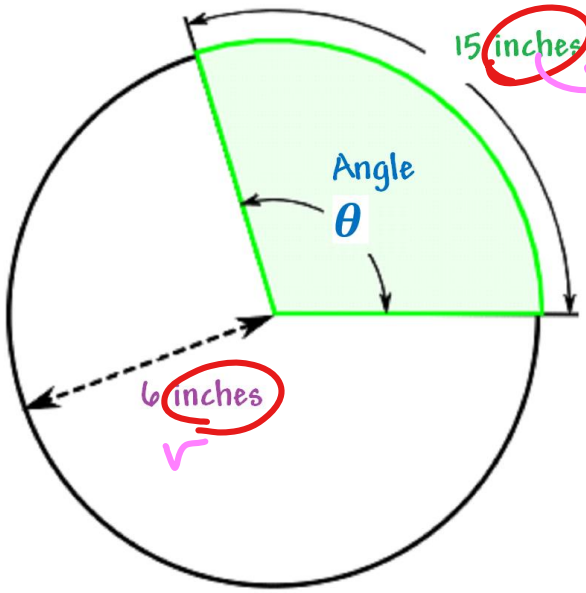
$$\text{Theta} = \frac{Arc\ Length}{r}$$

Degrees

$$\text{Theta} = \frac{Arc\ Length}{180 \times r}$$

Check it out:

Find the measure of the central angle

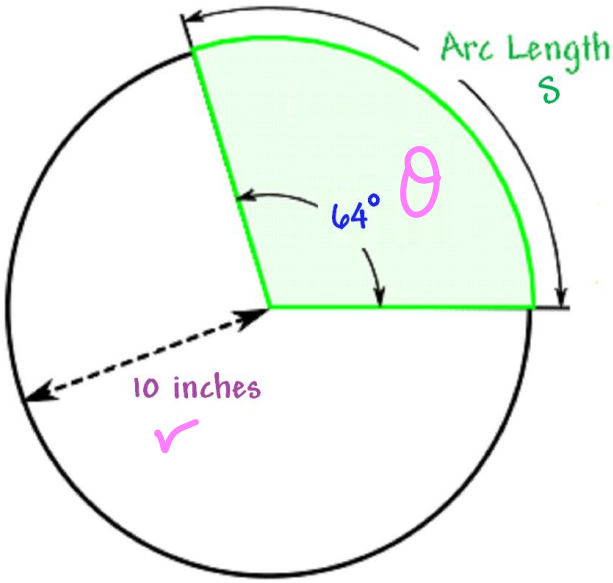


$\theta = \frac{\text{Arc Length}}{r} = \frac{s}{r}$

$\theta = \frac{15}{6}$

$\theta = \frac{5}{2}$ radians

Find the measure of the arc length



Arc Length $= \theta$ (radians)

$s = \theta \cdot r$

$s = 64^\circ (10 \text{ inch})$

$s = 640$ inches

Convert Degree to Radians and Vice Versa

Ok so let's say we have an angle that is in degrees but we need radians… how do we switch it???

Easy, All you need is one fact to remember!

π radians = 180 degrees

Check it out:

Convert 30° **to radians**

$$30^\circ\left(\frac{\pi}{180^\circ}\right) = \frac{30^\circ\pi}{180^\circ} = \frac{\pi}{6} \text{ Radians}$$

Convert $\frac{\pi}{3}$ **to degrees**

$$\frac{\pi}{3}\left(\frac{180^\circ}{\pi}\right) = \frac{180^\circ}{3} = 60^\circ$$