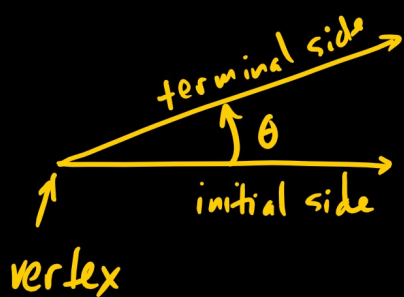
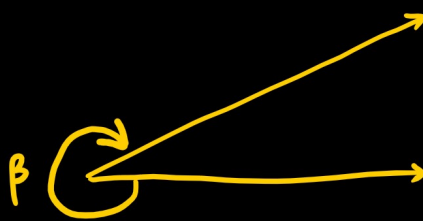


## Section 5.1 Angles and Their Measures

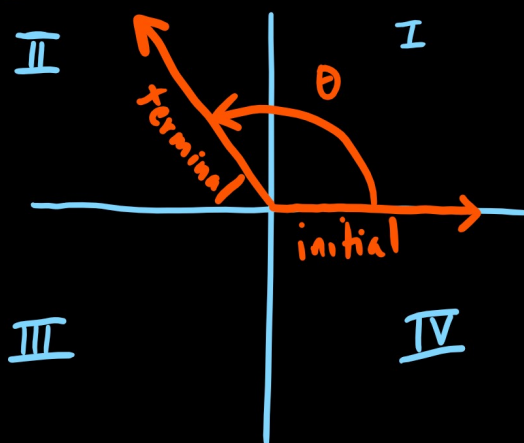


counter clockwise  
positive angle measure



clockwise  
negative angle measure

Standard Position - initial side is the positive x-axis



We say  $\theta$  lies in  
Quadrant II because  
its terminal side is in  
QII.

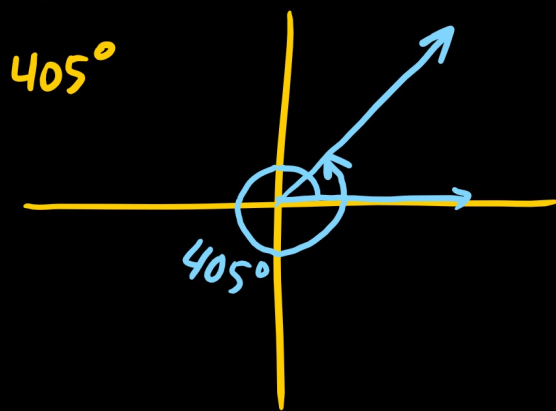
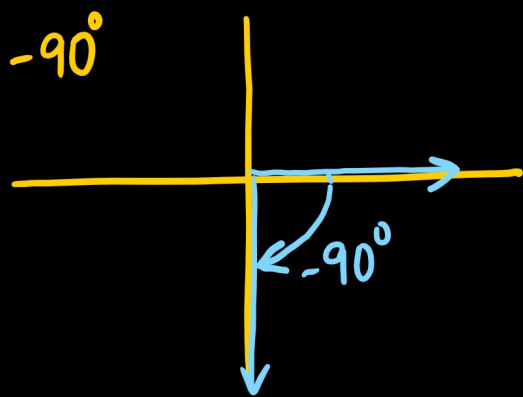
When the terminal side lies on an axis we  
say the angle is a quadrantal angle

One way to measure angles is in degrees.

There are  $360^\circ$  in one revolution. A straight

angle measures  $180^\circ$ . A right angle measures  $90^\circ$

ex: Draw angle in standard position.



Degrees, minutes, seconds

There are 60 seconds in 1 minute

There are 60 minutes in 1 degree

There 3600 seconds in 1 degree

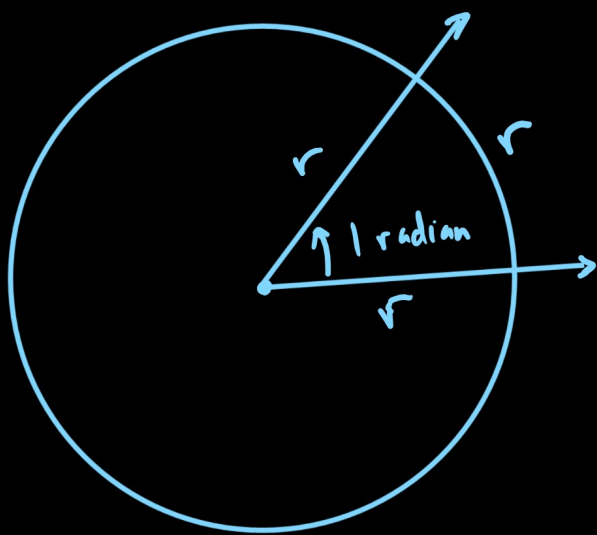
Convert to decimal:

$$50^\circ 6' 21'' = 50.106^\circ$$

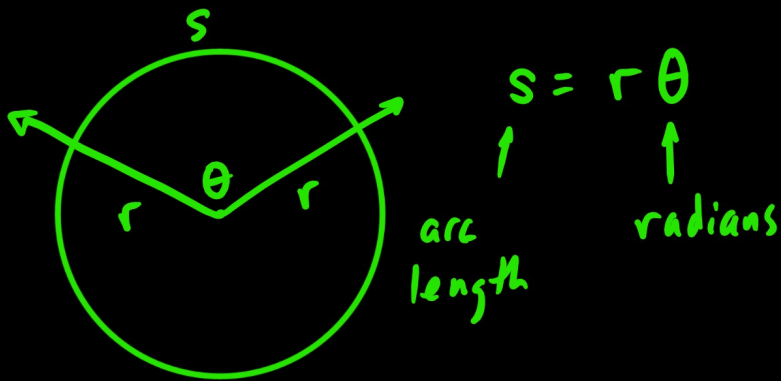
Convert to degrees, minutes, seconds

$$21.256^\circ = 21^\circ 15' 21.6''$$

A central angle is one whose vertex is the center of a circle.



If radius of the circle and the arc length are the same, this angle measures 1 radian.



What is angle in radians that is one revolution?

$$\text{one revolution} = \text{circumference}$$

$$r\theta = 2\pi r$$

$$\theta = 2\pi \text{ radians}$$

$$360^\circ = 2\pi \text{ radians}$$

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

$$1 \text{ radian} = \frac{180}{\pi} \text{ degrees}$$

To convert from degrees to radians, multiply by  $\frac{\pi}{180}$

To convert from radians to degrees, multiply by  $\frac{180}{\pi}$

ex: Convert  $315^\circ$  to radians

$$315 \cdot \frac{\pi}{180} = \frac{7}{4} \pi = \frac{7\pi}{4}$$

$$315 * 1/180 \triangleright \text{FRAC}$$

ex: Convert  $\frac{5\pi}{6}$  to degrees

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$$\frac{5\cancel{\pi}}{6} \cdot \frac{180}{\cancel{\pi}} = 150^\circ$$

5-40 mults of 5,  
69, 70, 75, 76

$$5/6 * 180$$

$$30) \frac{4\cancel{\pi}}{1} \cdot \frac{180}{\cancel{\pi}} = 720^\circ$$

$$40) \theta = \frac{1}{4} \quad s = r\theta$$
$$4 \cdot 6 = r \cdot \frac{1}{4} \cdot 4$$
$$s = 6 \text{ cm}$$
$$24 \text{ cm} = r$$