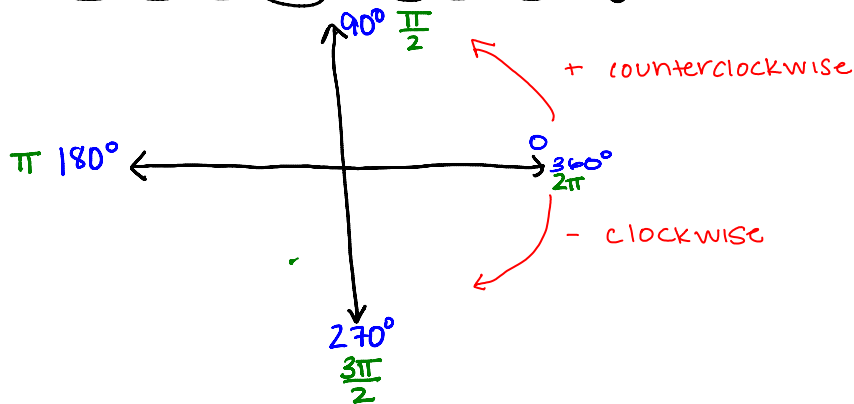


Intro to Circular Trigonometry



Converting Between Degrees and Radians

Radians \rightarrow Degrees

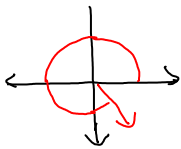
$$\text{radian measure} \cdot \frac{180}{\pi}$$

Degrees \rightarrow Radians

$$\text{degree measure} \cdot \frac{\pi}{180}$$

convert into radians.

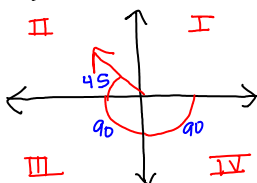
a) 300°



$$300 \cdot \frac{\pi}{180} = \frac{300\pi}{180} = \frac{5\pi}{3}$$

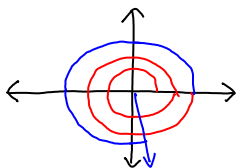
↓
reduce

b) -225°



$$-225 \cdot \frac{\pi}{180} = \frac{-225\pi}{180} = \frac{-5\pi}{4}$$

c) 1000°



$$1000 \cdot \frac{\pi}{180} = \frac{1000\pi}{180} = \frac{50\pi}{9}$$

Convert Radians TO Degrees

a) $\frac{7\pi}{3}$

$$\frac{7\cancel{\pi}}{3} \cdot \frac{180}{\cancel{\pi}} = \frac{7 \cdot 180}{3} = 420^\circ$$

b) $\frac{25\pi}{4}$

$$\frac{25\cancel{\pi}}{4} \cdot \frac{180}{\cancel{\pi}} = 1125^\circ$$

Degrees to Degrees, Minutes, Seconds''

60 minutes in 1 degree
 60 seconds in 1 minute
 → 3600 seconds in 1 degree

a) $\frac{57.3125}{\text{degrees}} \times 60 = \frac{18.75}{\text{min}} \times 60 = \frac{45}{\text{sec}}$

$$\frac{57^\circ}{\text{degrees}} \quad \frac{18'}{\text{minutes}} \quad \frac{45''}{\text{seconds}}$$

b) $\frac{101.6375}{\text{degrees}} \times 60 = \frac{38.25}{\text{min}} \times 60 = 15$

$$\frac{101^\circ}{\text{degrees}} \quad \frac{38'}{\text{minutes}} \quad \frac{15''}{\text{seconds}}$$

c) $\frac{308.9}{\text{degrees}} \times 60 = \frac{54}{\text{min}}$

$$\frac{308^\circ}{\text{degrees}} \quad \frac{54'}{\text{minutes}} \quad \frac{0''}{\text{seconds}}$$

D°M'S'' → Degrees

$$\text{Degrees} + \left(\frac{\text{Minutes}}{60}\right) + \left(\frac{\text{Seconds}}{3600}\right) = \text{Degrees (four decimal places)}$$

a) $29^\circ 45' 30''$

$$29 + \left(\frac{45}{60}\right) + \left(\frac{30}{3600}\right) = 29.7583^\circ$$

b) $310^\circ 30' 21''$

$$310 + \left(\frac{30}{60}\right) + \left(\frac{21}{3600}\right) = 310.5058^\circ$$