

# WELCOME TO TRIGONOMETRY

Trigonon = Triangle  
 Metry = Measure

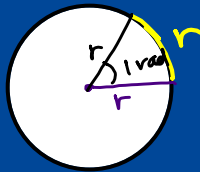
Degrees  $1^\circ = 60'$   
 $1' = 60''$

Find the complement  
 of  $72^\circ 14'$

$$\begin{array}{r} 89^\circ \quad 60' \\ 90^\circ \quad 00' \\ - 72^\circ \quad 14' \\ \hline 17^\circ \quad 46' \end{array}$$

$$\begin{array}{r} 32^\circ 40' 51'' \\ + 13^\circ 24' 11'' \\ \hline 46^\circ 65' 62'' \\ 46^\circ 5' 2'' \end{array}$$

## RADIANS



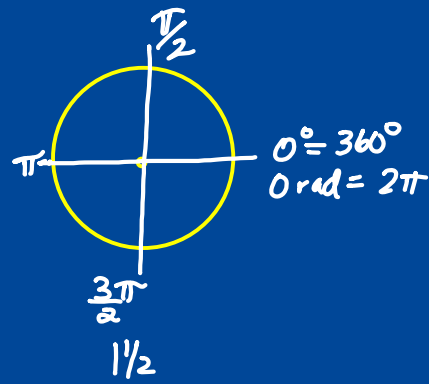
$$\frac{360^\circ}{2\pi r} = \frac{1 \text{ rad}}{r}$$

$$360^\circ r = 2\pi r \text{ rad}$$

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

$$\boxed{180^\circ = \pi \text{ rad}}$$

$$56.3^\circ = 1 \text{ rad}$$



$$40 \frac{\cancel{\text{ft}}}{5} \cdot \frac{12 \text{ in}}{1 \cancel{\text{ft}}}$$

Convert  $120^\circ$  to rads

$$120^\circ \cdot \frac{\pi \text{ rad}}{180^\circ} = \frac{120\pi}{180} = \frac{2\pi}{3} \text{ rad.}$$

Convert  $\frac{11\pi}{9}$  rad to degrees.

$$\frac{11\pi \text{ rad}}{9} \cdot \frac{180^\circ}{\pi \text{ rad}} = \frac{11 \cdot 180^\circ}{9} = 220^\circ$$

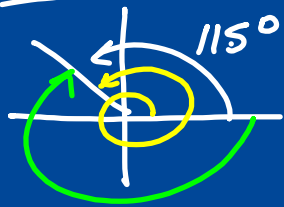
Deg  $\rightarrow$  Rads

$$\times \frac{\pi}{180^\circ}$$

Rads  $\rightarrow$  Deg

$$\times \frac{180^\circ}{\pi}$$

# COTERMINAL ANGLES



$$\begin{array}{r} 360^\circ \\ - 115^\circ \\ \hline 245^\circ \end{array}$$

$$\begin{array}{r} 360^\circ \\ + 115^\circ \\ \hline 475^\circ \end{array}$$

$-245^\circ$

- Angles that share the same terminal side.

Given:  $\frac{7\pi}{5} = 1\frac{2}{5}\pi$



$$\begin{array}{r} + 2\pi \\ \hline 3\frac{2}{5}\pi \\ \boxed{\frac{17\pi}{5}} \end{array}$$

$$\begin{aligned} 2\pi - \frac{7\pi}{5} &= \frac{2}{1} - \frac{7}{5} \\ &= \frac{10}{5} - \frac{7}{5} \\ &= \boxed{\frac{3\pi}{5}} \end{aligned}$$

## RIGHT Δ TRIG

$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}}$$

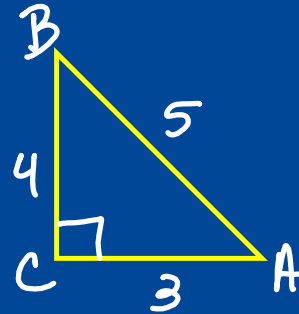
$$\tan A = \frac{\text{opp}}{\text{adj}}$$

soh cah toa

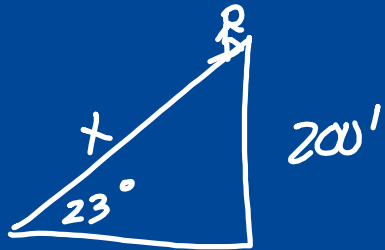
$$\csc A = \frac{\text{hyp}}{\text{opp}}$$

$$\sec A = \frac{\text{hyp}}{\text{adj}}$$

$$\cot A = \frac{\text{adj}}{\text{opp}}$$



$$\cos A = \frac{3}{5} \quad \frac{\text{adj.}}{\text{hyp}}$$



$$x \cdot \sin 23^\circ = \frac{200}{x}$$

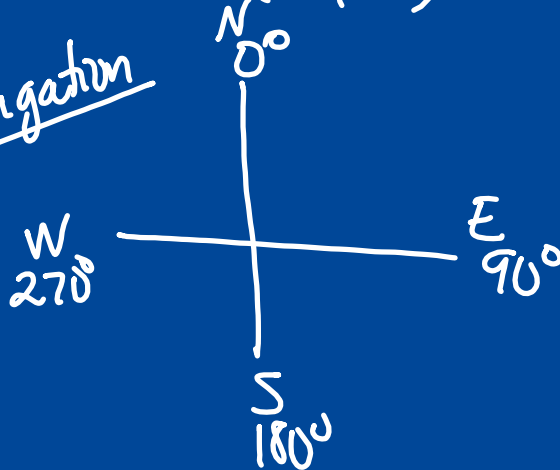
$$x = \frac{200}{\sin 23^\circ}$$

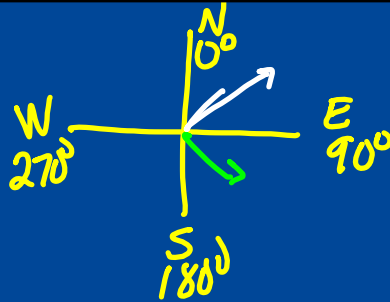
$$x = ?$$

$$\cos A = \frac{12}{17}$$

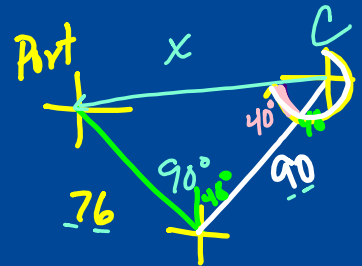
$$\cos^{-1}\left(\frac{12}{17}\right)$$

Navigation



NAVIGATIONShipSail 76 mi @  $138^\circ$ Turn: Sail 90 mi. @  $48^\circ$ 

How far &amp; in what direction must is sail to get back to port?



$$76^2 + 90^2 = x^2$$

$$118 = x$$

$$\approx 120 \text{ mi}$$

$$\tan C = \frac{76}{90} \quad \frac{180}{+88} = 268^\circ$$

$$\tan^{-1}(76/90) = 40^\circ$$

$$120 \text{ mi @ } 268^\circ$$