

# WELCOME TO TRIGONOMETRY

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

## Triangle Measure

$$\begin{array}{r} 83^\circ 27' 2'' \\ \hline 32^\circ 40' 51'' \\ + 13^\circ 24' 11'' \\ \hline 151^\circ 62'' \\ \hline \boxed{46^\circ 5' 2''} \end{array}$$

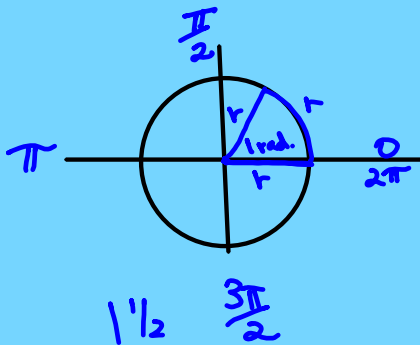
Find the complement

of  $37^\circ 51'$

$$\begin{array}{r} 90^\circ 60' \\ - 37^\circ 51' \\ \hline 52^\circ 9' \end{array}$$

## RADIANS

$47^\circ \cdot 22' =$  deg-ft



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

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

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

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

Convert  $100^\circ$  to rads.

$$100^\circ \cdot \frac{\pi \text{ rads}}{180^\circ} = \frac{100\pi}{180} = \frac{5\pi}{9} \text{ rads}$$

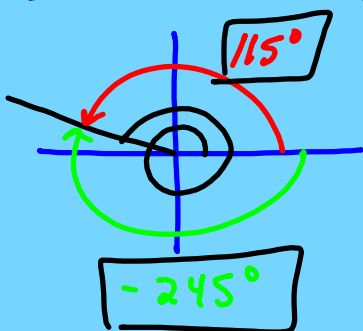
Deg  $\rightarrow$  Rads  
 $\times \frac{\pi}{180}$

Convert  $\frac{11\pi}{15}$  rads to deg.

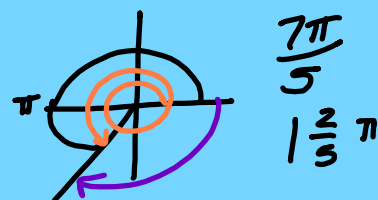
$$\frac{11\pi}{15} \cdot \frac{180^\circ}{\pi} = 132^\circ$$

Rads  $\rightarrow$  Deg  
 $\times \frac{180^\circ}{\pi}$

Coterminal angles - angles which end at the same pt.



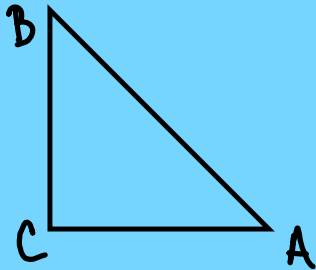
$$\begin{array}{r} 475^\circ \\ -360^\circ \\ \hline 115^\circ \end{array} \quad \begin{array}{r} 360^\circ \\ -115^\circ \\ \hline 245^\circ \end{array}$$



$$\frac{7\pi}{5} + \frac{2\pi}{1} = \frac{7\pi}{5} + \frac{10\pi}{5} = \frac{17\pi}{5}$$

$$\frac{2\pi}{1} - \frac{7\pi}{5} = \frac{10\pi}{5} - \frac{7\pi}{5} = \frac{3\pi}{5}$$

# RIGHT $\Delta$ TRIG



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

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

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

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

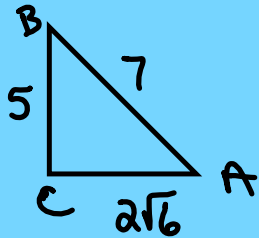
$$\tan A = \frac{\text{opp}}{\text{adj}}$$

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

Dscar had a heap of apples

Soh cah toa

Given  $\sin A = \frac{5}{7}$ , find the other 5 trig functions.



$$b^2 + 25 = 49$$

$$\sqrt{b^2} = \sqrt{24}$$

$$b = 2\sqrt{6}$$

$$\sin A = \frac{5}{7} \quad \csc A = \frac{7}{5}$$

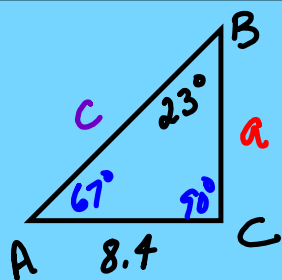
$$\cos A = \frac{2\sqrt{6}}{7} \quad \sec A = \frac{7 \cdot \sqrt{6}}{2\sqrt{6} \cdot \sqrt{6}}$$

$$= \frac{7\sqrt{6}}{12}$$

$$\tan A = \frac{5\sqrt{6}}{2\sqrt{6} \cdot \sqrt{6}}$$

$$= \frac{5\sqrt{6}}{12}$$

$$\cot A = \frac{2\sqrt{6}}{5}$$



Find all missing parts.

$$C = 90^\circ$$

$$A = 90^\circ - 23^\circ = 67^\circ$$

$$8.4 \tan 67^\circ = \frac{a}{8.4} \cdot 8.4 \quad c \cdot \cos 67^\circ = \frac{8.4}{c} \cdot c$$

$$19.789 = a$$

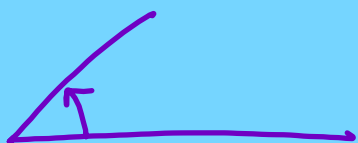
$$20 \approx a$$

$$c = \frac{8.4}{\cos 67^\circ}$$

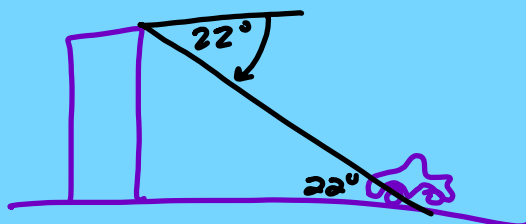
$$c = 21.498$$

$$\approx 21$$

angle of elevation



angle of depression



How far apart are cats?

Angle of depr yellow =  $10^\circ$   
 Angle of depr orange =  $17^\circ$



$$\tan 10^\circ = \frac{10}{x}$$

$$x = \frac{10}{\tan 10^\circ}$$

$$x = 57$$

$$\tan 17^\circ = \frac{10}{y}$$

$$y = \frac{10}{\tan 17^\circ}$$

$$y = 33'$$

$$\begin{array}{r} 57' \\ - 33' \\ \hline 24' \end{array}$$

# NAVIGATION

Ship

Sail 76 mi @  $138^\circ$

Turn 90 mi @  $48^\circ$

What direction must you sail to return to original port.

$$\tan A = \frac{76}{90}$$

$$A = 40^\circ$$

