Right angled triangles ratios

short form

sine θ = $\frac{\text{opposite}}{\text{hypotenuse}}$ $\sin\theta = \frac{opp}{hyp}$

cosine θ = $\frac{\text{adjacent}}{\text{hypotenuse}}$ $\cos\theta = \frac{adj}{hyp}$

tangent θ = $\frac{\text{opposite}}{\text{adjacent}}$ $\tan\theta = \frac{opp}{adj}$

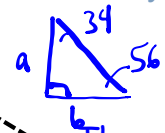
acronym..... SOH CAH TOA

Trigonometric Ratios

- Each angle has a specific trigonometric ratio

ie. $\tan 56^\circ = 1.4826$ (ALWAYS carry 4 decimal places!!)

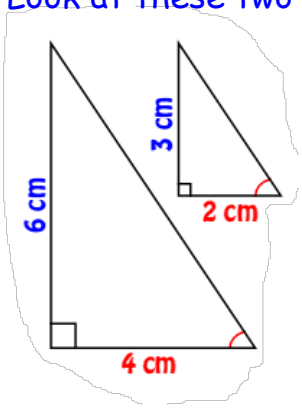
$\cos 50^\circ = 0.6428$



$\tan 56^\circ = \frac{a}{b}$

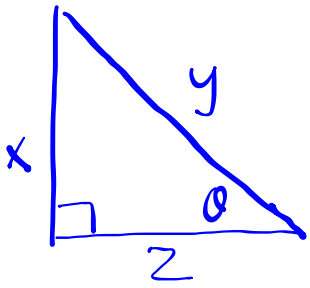
These ratios will be found using a scientific calculator

Look at these two triangles...they are similar.



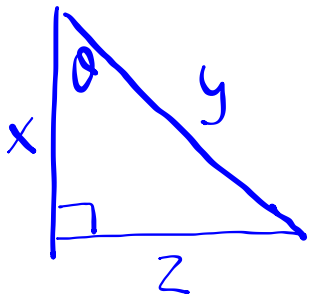
Even though these triangles are different sizes, the ratios of their sides would be equal.

This confirms that as long as the angles are the same measure, the trigonometric ratios will be the same.



$\tan\theta = \frac{opp}{adj} = \frac{x}{z}$

$\cos\theta = \frac{adj}{hyp} = \frac{z}{y}$

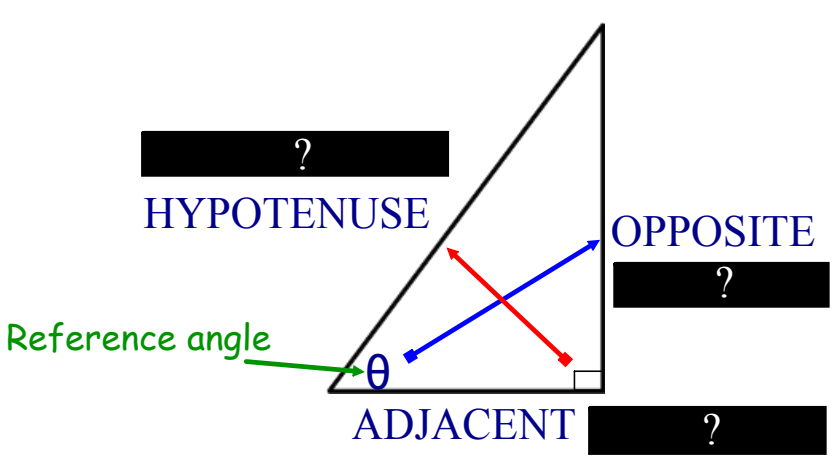


$\tan\theta = \frac{opp}{adj} = \frac{z}{x}$

$\cos\theta = \frac{adj}{hyp} = \frac{x}{y}$

Trigonometric Ratios

*** Must have calculator in DEGREE mode ***



$$\sin\theta = \frac{opp}{hyp}$$

$$\cos\theta = \frac{adj}{hyp}$$

$$\tan\theta = \frac{opp}{adj}$$

"These are called the Primary Trig Ratios"

REMEMBER: "SOH CAH TOA"

Homework...

$\frac{x}{4} = \frac{3}{7} \rightarrow x = \frac{3(4)}{7} = \frac{12}{7}$

$\frac{7x}{7} = \frac{3(4)}{7}$

$x = \frac{12}{7}$

$\frac{4}{x} = \frac{1.5}{6}$

$\frac{4(6)}{15} = \frac{15(x)}{15}$

$\frac{8}{5} = x$

$1.6 = x$

Examples

1. $\cos 74^\circ = 0.2756$

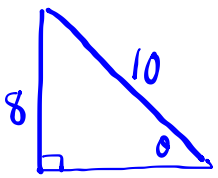
2. $\sin\theta = 0.5$

$\theta = \sin^{-1} 0.5$

$= 30^\circ$

.... $\frac{\sin\theta}{\sin} = \frac{0.5}{\sin}$

3.



$\sin\theta = \frac{opp}{hyp}$

$= \frac{8}{10}$

$\theta = \sin^{-1} 0.8$

$= 53^\circ$