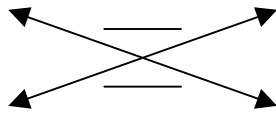


TRIGONOMETRY

Learn to cross multiply before you tackle the trig problems

$$\frac{\text{topleft}}{\text{bottomleft}} = \frac{\text{topright}}{\text{bottomright}}$$

we can move diagonally through the "="



$$\frac{a}{b} = \frac{c}{d}$$

we could write $\frac{a}{1} = \frac{cb}{d}$ b moves ↗

or $\frac{ad}{b} = \frac{c}{1}$ ↙ d moves

or $\frac{a}{c} = \frac{1}{d}$ c moves ↘

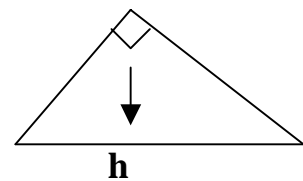
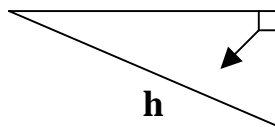
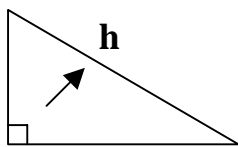
or $\frac{1}{b} = \frac{c}{da}$ ↙ a moves

Now learn **SOHCAHTOA** which tells us that:

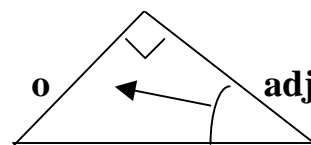
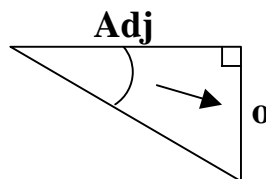
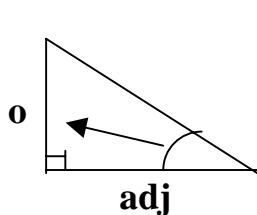
The ratio **S**ine = **O**pposite/**H**ypotenuse, **C**osine = **A**djacent/**H**ypotenuse
And **T**angent = **O**pposite/**A**djacent

So **S=O/H, C=A/H, T=O/A**

Now learn to identify the sides: the **hypotenuse** is the easiest - it is the longest side and opposite the right angle



the **opposite** is opposite the angle you will use to get your answer



and the **adjacent** lies next to the angle in question or between the right angle and the angle in question.

After identifying the sides, your opening line will always read

$$\text{Sin (angle)} = \frac{\textit{opposite}}{\textit{hypotenuse}} \quad \text{if opposite and hypotenuse are involved}$$

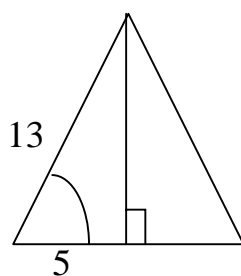
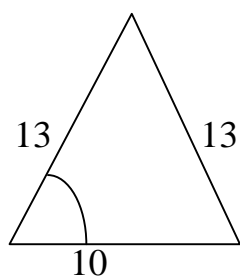
$$\text{Cos (angle)} = \frac{\textit{adjacent}}{\textit{hypotenuse}} \quad \text{if adjacent and hypotenuse are involved}$$

$$\text{Tan (angle)} = \frac{\textit{opposite}}{\textit{adjacent}} \quad \text{if opposite and adjacent are involved}$$

Your second line will depend on the position of the unknown side or angle

<u>Opening line</u>	$\sin 27 = \frac{x}{9}$ <i>x is in the top right position</i>	$\cos 52 = \frac{7}{x}$ <i>x is in the bottom right position</i>	$\text{Tan } x = \frac{3}{4}$ <i>x is the missing angle</i>
<u>Second line</u> Use cross multiplication Or Inv button	<i>Move the 9</i> $9 \sin 27 = x$ <i>multiply 9 by sin 27</i>	<i>Swap the x and the cos 52</i> $x = \frac{7}{\cos 52}$	<i>Use the inverse tan button</i> $\text{Inv tan} \left(\frac{3}{4} \right)$
<u>Finish</u>	$4.09 = x$	$x = 11.37$	$x = 36.87 \text{ degrees}$

NOTE: you can only use trigonometry with right angled triangles
If there is no right angle, make one!



$$\text{Cos } x = \frac{5}{13}$$

$$\underline{x = 67.38^\circ}$$