

Trigonometry

The ratio of any two sides of a right angled triangle will always remain the same if the angles stay the same. From this we can find three ratios:-

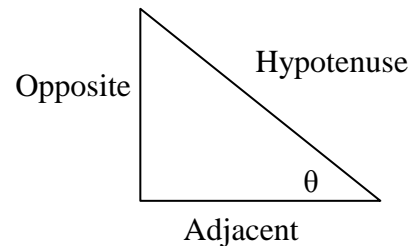
$$\sin \theta = \frac{\text{opp}}{\text{hyp}} \qquad \cos \theta = \frac{\text{adj}}{\text{hyp}} \qquad \tan \theta = \frac{\text{opp}}{\text{adj}}$$

It is important the sides are always named relative to the angle given (this does not include the right angle)

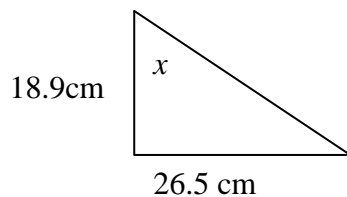
Hypotenuse is always across from the right angle, it never touches it

Opposite faces the given angle but never touches it.

Adjacent is next to the angle and it touches both the right angle and the given angle.



Example 1. Find the size of angle x



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

$$\tan x = \frac{26.5}{18.9}$$

$$\tan x = 1.402$$

$$x = 54.5\text{cm (1dp)}$$

If x is the angle then work out the fraction and use shift tan

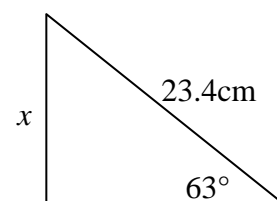
Example 2. Find the size of length x

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

$$\sin 63^\circ = \frac{x}{23.4}$$

$$\sin 63^\circ \times 23.4 = x$$

$$x = 20.85\text{cm}$$



If x is at the top of the fractions then you need to multiply

“top means times”

Example 3.

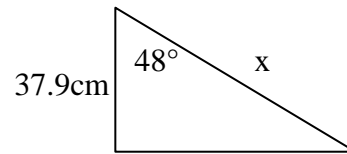
Find the size of length x

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

$$\cos 48^\circ = \frac{37.9}{x}$$

$$x = \frac{37.9}{\cos 48}$$

$$x = 56.64\text{cm (2dp)}$$



If x is at the bottom then you need to divide the number by sin/cos or tan

“bottom means divide”

Remember:

If x is at the top then times

If x is at the bottom then divide

If x is the angle then work out the fraction and then shift sin/cos/tan