

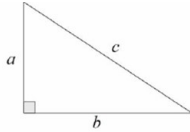
2D Pythagoras

This is only for right angled triangles

$$a^2 + b^2 = c^2$$

To find the hypotenuse (longest side); square, add and square root.

To find one of the shorter sides; square, subtract and square root.



Year 10 higher topic 13 More Trigonometry

What careers would use these skills?

Urban and regional planners, surveying engineers, architects, cartographer (for drawing maps), building inspectors.

Sine rule (for non right-angle triangles)

Use with questions involving 2 sides and 2 angles.

For missing side:

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

For missing angle:

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

Cosine rule (for non right-angled triangles)

Use with questions involving 3 sides and 1 angle.

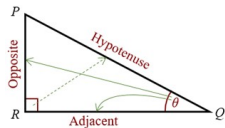
For missing side:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

For missing angle:

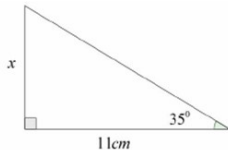
$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

Trigonometry (SOHCAHTOA)



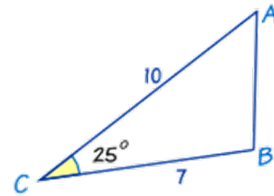
$$x = 11 \times \tan 35$$

$$= \underline{7.70\text{cm}} \text{ (2dp)}$$



Area of a non-right-angled triangle

$$\text{Area} = \frac{1}{2}ab \sin C$$



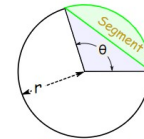
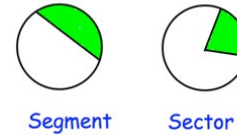
$$\text{Area} = \frac{1}{2} \times 7 \times 10 \times \sin 25$$

$$= \underline{14.8}$$

Area of a segment

The region of a circle bounded by a chord and the arc subtended by the chord.

$$\text{area} = \text{sector area} - \text{triangle area}$$



3D Pythagoras

Find missing lengths by identifying right angled triangles.

You will often have to find a missing length you are not asked for before finding the missing length you are asked for.

Eg. Can a pencil that is 20cm long fit in a pencil tin with dimensions 12cm, 13cm and 9cm? The pencil tin is in the shape of a cuboid.

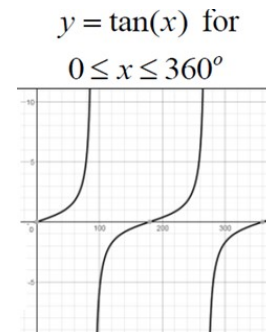
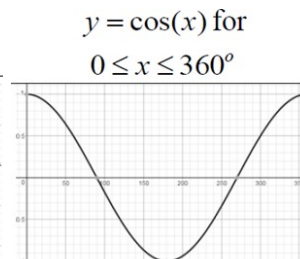
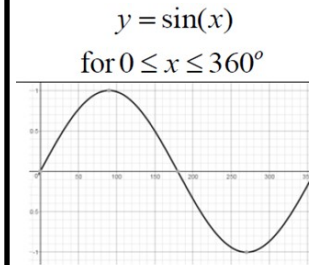
$$\text{Hypotenuse of base} = \sqrt{12^2 + 13^2}$$

$$= 17.7$$

Exact trig values

	0°	30°	45°	60°	90°
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	---

Sin, cos and tan graphs



3D trigonometry

Find missing lengths by identifying right angled triangles.

You will often have to find a missing length you are not asked for before finding the missing length you are asked for.

