

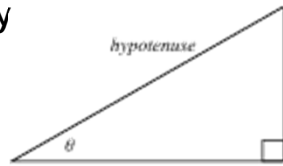
# Maths Knowledge Organiser

## Year 10 (H) More trig



### Right angles trigonometry

A process to find missing sides and angles when using other sides and angles



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

SOH



$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

CAH

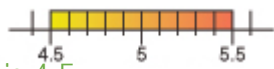


$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

TOA

### Upper and lower bounds

If a number has been rounded it has a range of answers it could have been. 5 has been rounded to the nearest whole number.



Lower bound is 4.5

Upper bound is 5.5

$$4.5 \leq x < 5.5$$

### Area of a triangle

We can calculate the area of a triangle using trigonometry.

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

Where a and b are the sides either side of angle C.

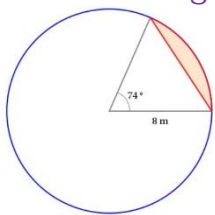
### Area of a triangle

We can calculate the area of a triangle using trigonometry.

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

Where a and b are the sides either side of angle C.

### Area of a segment (red area)



Area of sector

$$= \frac{74}{360} \times \pi \times 8^2$$

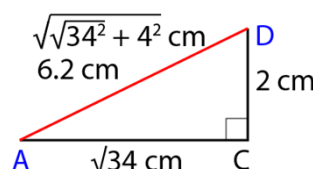
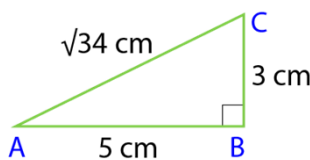
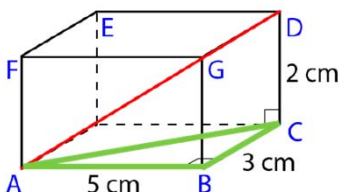
Area of triangle

$$= \frac{1}{2} \times 8 \times 8 \times \sin 74$$

Then subtract

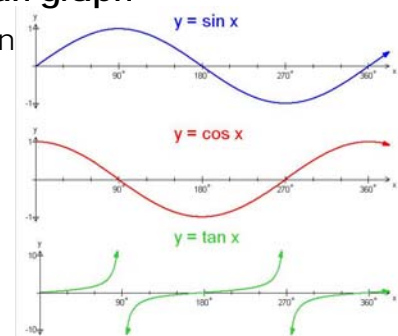
### 3D Pythagoras

$a^2 = b^2 + c^2$  can be used in 3D. Simply draw out 2D diagrams and carry your answer forward.



### Sine, cos and tan graph

These graphs can be used to work other angles out in a particular questions

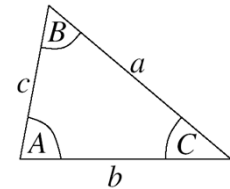


### Sine rule

A triangle which involves angle side pairing can use the sine rule to solve it

$$\text{Sides} \rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{Angles} \rightarrow \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



### Cosine rule

A triangle which involves an angle (A) between 2 sides (b and c) can use the cosine rule

$$\text{Sides} \rightarrow a^2 = b^2 + c^2 - 2bc \cos A$$

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

### Bearings

Are just angles. Draw out a diagram and apply Pythagoras, SOHCAHTOA, sine rule or cosine rule