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# **The Inside Track to GCSE Success**

## **Maths**

### **Formula Sheet**

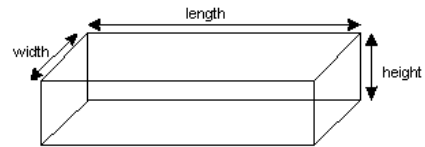
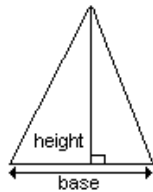


## Maths Formula Sheet

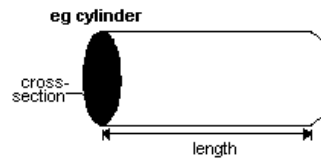
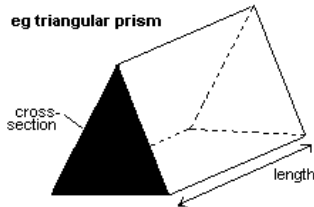
These formulae will help you to do the questions in this program. You will be given a formula sheet similar to this in your exam.

### Lower Tier

#### Shape and Space



Area of a triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$ ; Volume of a cuboid = length  $\times$  width  $\times$  height



Prism (including cylinder): Volume = area of cross-section  $\times$  length

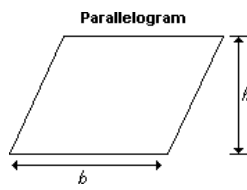
#### Handling Data

Probability of an event with equally likely outcomes is:

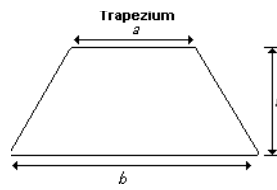
$$\frac{\text{number of favourable outcomes}}{\text{total possible outcomes}}$$

## Additional Material: Middle Tier

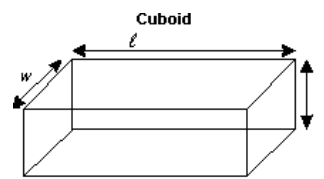
### Mensuration



Area =  $bh$



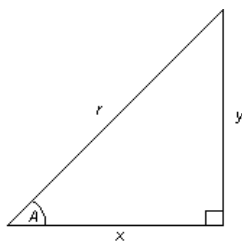
Area =  $\frac{1}{2} (a + b)h$



Volume =  $lwh$

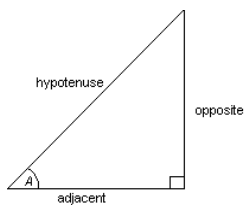
### Trigonometry

#### Right-angled triangle



$r^2 = x^2 + y^2$  (result of Pythagoras)

$x = r \cos A$ ,  $y = r \sin A$ ,  $y = x \tan A$



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

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

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

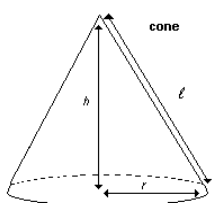
## Number

Standard form is  $a \times 10^n$  where  $1 \leq a < 10$  and  $n$  is an integer.

## Additional Material: Higher Tier

### Mensuration

Cylinder (radius $r$ , height $h$ ):	Area of curved surface = $2\pi rh$
Sphere (radius $r$ ):	Volume = $\frac{4}{3} \pi r^3$ Area of surface = $4\pi r^2$
Pyramid (including cone):	Volume = $\frac{1}{3} \times \text{area of base} \times \text{height}$
Cone (radius $r$ , height $h$ ):	Area of curved surface = $\pi rl$



$$\sqrt{h^2 + r^2}$$

where  $l$  = slant height =

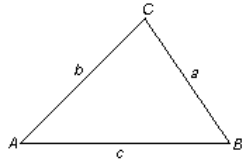
### Algebra

The quadratic equation  $ax^2 + bx + c = 0$  has solutions:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

## Trigonometry

### Any Triangle



In any triangle ABC:

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

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

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

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