



GCSE 9-1 MATHEMATICS FORMULAE

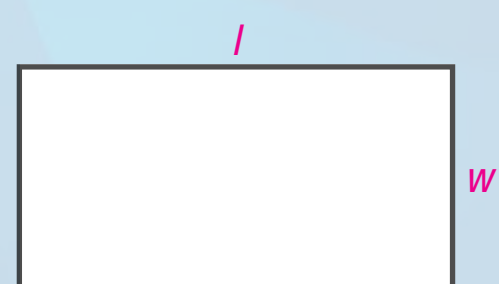
SUITABLE FOR AQA AND EDEXCEL / HIGHER TIER

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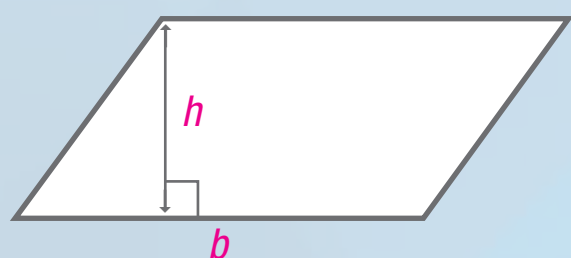
Formulae to Memorise

You will not be given these formulae in the exam

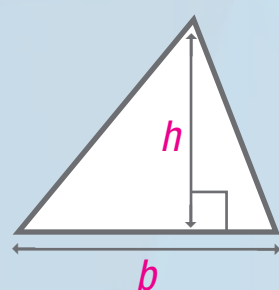
Areas



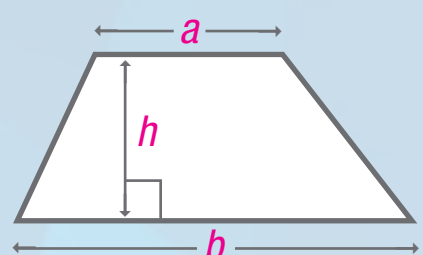
Area of a rectangle = $l \times w$



Area of a parallelogram = $b \times h$

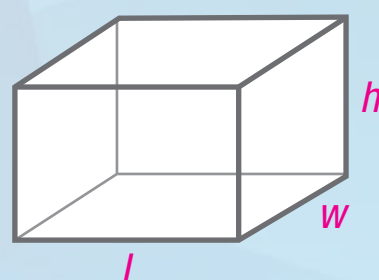


Area of a triangle = $\frac{1}{2} b \times h$

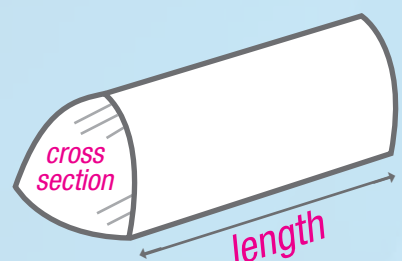


Area of a trapezium = $\frac{1}{2} (a + b) h$

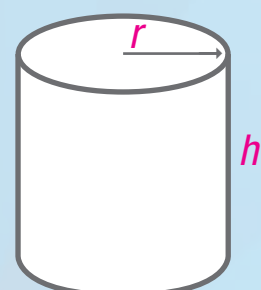
Volumes



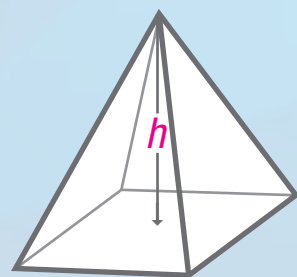
Volume of a cuboid = $l \times w \times h$



Volume of a prism = area of cross section \times length

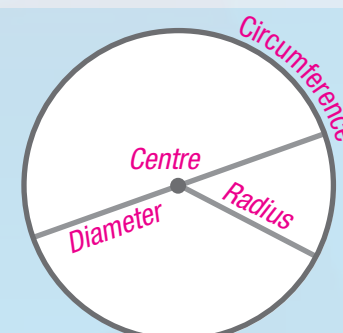


Volume of a cylinder = $\pi r^2 h$



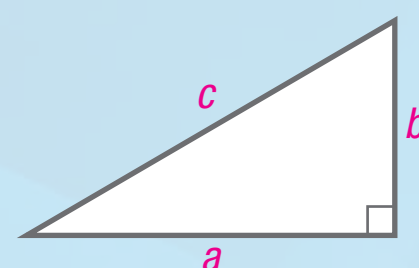
Volume of a pyramid = $\frac{1}{3} \times$ area of base $\times h$

Circumference and Area of a Circle



Circumference of a circle = $2\pi r = \pi d$
Area of a circle = πr^2

Pythagoras' Theorem



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

Compound Measures

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

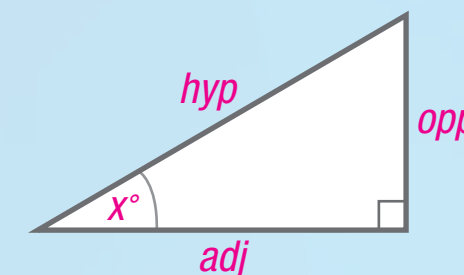
$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The Quadratic Formula

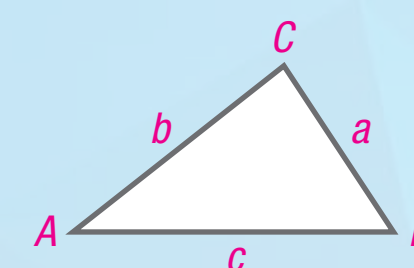
The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by:

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

Trigonometry



$$\sin x = \frac{\text{opp}}{\text{hyp}}, \quad \cos x = \frac{\text{adj}}{\text{hyp}}, \quad \tan x = \frac{\text{opp}}{\text{adj}}$$



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

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

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

Compound Interest*

Where P is the principal amount, r is the interest rate (as a percentage) over a given period and n is the number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability*

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

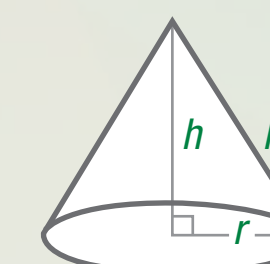
Conditional Probability

$$P(A \text{ and } B) = P(A \text{ given } B) \times P(B)$$

Formulae given in the Exam

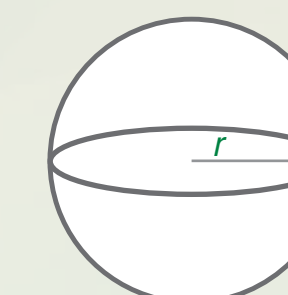
You do not need to memorise these formulae

Volume and Surface Area



Curved surface area of a cone = $\pi r l$

$$\text{Volume of a cone} = \frac{1}{3} \pi r^2 h$$



Surface area of a sphere = $4\pi r^2$

$$\text{Volume of a sphere} = \frac{4}{3} \pi r^3$$

Kinematics Formulae

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t=0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2} at^2$$

$$v^2 = u^2 + 2as$$

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*Students sitting AQA examinations are expected to know or be able to derive the formulae for Compound Interest and Probability. Knowledge or derivation of these formulae is not specified in the Edexcel Specification.