

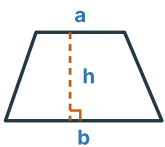
AQA GCSE Maths Formula Sheet

FOUNDATION

AQA GCSE Mathematics (8300) · Foundation Tier

1 Given in Your Exam

These formulas are printed on the formulae sheet in every AQA GCSE Foundation paper. You don't need to memorise them, but you do need to know when and how to use each one.



Area of a Trapezium

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

a and b are the parallel sides, h is the perpendicular height



Volume of a Prism

$$V = \text{area of cross-section} \times \text{length}$$

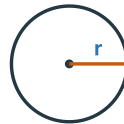
Works for any prism, including a cylinder



Circumference of a Circle

$$C = 2\pi r = \pi d$$

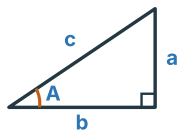
r is the radius, d is the diameter



Area of a Circle

$$A = \pi r^2$$

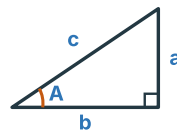
r is the radius



Pythagoras' Theorem

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

In a right-angled triangle, c is the hypotenuse



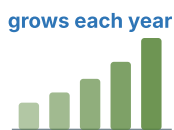
Trigonometric Ratios

$$\sin A = \frac{a}{c}$$

$$\cos A = \frac{b}{c}$$

$$\tan A = \frac{a}{b}$$

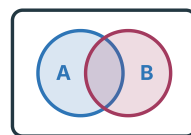
SOH CAH TOA: a is opposite A, b is adjacent to A, c is the hypotenuse



Compound Interest

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

P is the amount invested, r is the % rate per period, n is the number of periods



Probability: A or B

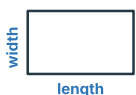
$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

For any two events A and B

2 Learn These by Heart

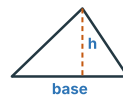
These are **not** given in the exam. Students lose marks on them every year, so learn them until you can write them from memory.

SHAPE AND SPACE



Area of a Rectangle

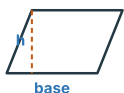
$$A = \text{length} \times \text{width}$$



Area of a Triangle

$$A = \frac{1}{2} \times \text{base} \times \text{height}$$

The height is perpendicular to the base

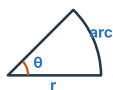


Area of a Parallelogram

$$A = \text{base} \times \text{perpendicular height}$$

Volume of a Cuboid

$$V = \text{length} \times \text{width} \times \text{height}$$



Arc Length and Sector Area

$$\text{Arc} = \frac{\theta}{360} \times 2\pi r$$

$$\text{Sector} = \frac{\theta}{360} \times \pi r^2$$

θ is the angle at the centre



Angles in Polygons

Interior angles add to $(n - 2) \times 180^\circ$

Exterior angles add to 360°

n is the number of sides; a triangle is 180° , a quadrilateral 360°

NUMBER AND MEASURES



Speed, Distance and Time

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Cover the one you want in the triangle

Density and Pressure

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

Check the units match before you calculate

Percentage Change

$$\% \text{ change} = \frac{\text{change}}{\text{original}} \times 100$$

Use the original amount, not the new one

Reverse Percentages

$$\text{Original} = \frac{\text{new amount}}{\text{multiplier}}$$

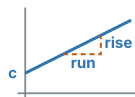
For a 20% increase the multiplier is 1.2; for a 20% decrease it is 0.8

Simple Interest

$$\text{Interest} = P \times \frac{r}{100} \times n$$

P is the amount, r is the % rate, n is the number of years

ALGEBRA



Straight-Line Graphs

$$y = mx + c$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

m is the gradient, c is the y-intercept

n th Term of a Linear Sequence

$$\text{nth term} = dn + (\text{first term} - d)$$

d is the common difference

Laws of Indices

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

Difference of Two Squares

$$a^2 - b^2 = (a + b)(a - b)$$

TRIGONOMETRY

Exact Trigonometric 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	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	–

STATISTICS AND PROBABILITY

Mean

$$\text{Mean} = \frac{\text{total of the values}}{\text{number of values}}$$

From a table: $\Sigma fx \div \Sigma f$ (Σ means "add up")

Probability Basics

$$P(\text{not } A) = 1 - P(A)$$

$$\text{Expected number} = P(A) \times \text{number of trials}$$

Independent Events

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

Only when one event does not affect the other

Write It First

Write the formula down before you substitute. You can earn a method mark even if the answer goes wrong.

Check the Units

Make sure every length is in the same unit before you use a formula.

Test Yourself

Cover the right-hand side of each card and try to write the formula from memory.

Need Help Using These Formulas?

Book a free 90-minute lesson and I'll show your child exactly when and how to use each one.

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