STUDY FORMULA BOOKLET

AQA GCSE Maths 8300 Higher formulae sheet

The Higher sheet prints trapezium, prism and circle formulae, the quadratic formula, Pythagoras, trigonometry, compound interest and two probability rules. Learn everything else.

IN THE BOOKLET printed in the official booklet LEARN IT not printed: students must recall it

Based on the official **GCSE Mathematics Higher Tier Formulae Sheet (8300), AQA insert IB/M/Insert to GCSE Mathematics Higher Tier/E5, for exams in 2024 only**, with what to learn and exam tips added by CuratedPrep.

Perimeter, area and volume

Printed on the sheet for the Higher paper.

Area of a trapezium a and b are the lengths of the parallel sides; h is their perpendicular separation.	$A = \frac{1}{2}(a+b)h$	IN THE BOOKLET
Volume of a prism Works for cuboids and cylinders: a cylinder is V = πr²h.	$V = \text{area of cross section} \times \text{length}$	IN THE BOOKLET
Circumference of a circle r is the radius and d is the diameter.	$C = 2\pi r = \pi d$	IN THE BOOKLET
Area of a circle r is the radius. Leave answers in terms of π when asked.	$A = \pi r^2$	IN THE BOOKLET

Quadratic formula

Higher tier only.

Solution of a quadratic equation Solves ax² + bx + c = 0 where a is not zero. Rearrange to equal zero first.	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	IN THE BOOKLET

Pythagoras' theorem and trigonometry

Pythagoras' theorem Right-angled triangle; c is the hypotenuse, the longest side.	$a^2 + b^2 = c^2$	IN THE BOOKLET
Sine ratio Right-angled triangle ABC: opposite over hypotenuse (a is opposite A).	$\sin A = \frac{a}{c}$	IN THE BOOKLET
Cosine ratio Adjacent over hypotenuse (b is next to A).	$\cos A = \frac{b}{c}$	IN THE BOOKLET
Tangent ratio Opposite over adjacent.	$\tan A = \frac{a}{b}$	IN THE BOOKLET
Sine rule Any triangle ABC. Use it with a matching side and angle pair.	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	IN THE BOOKLET
Cosine rule Any triangle ABC. Use it for two sides and the included angle, or all three sides.	$a^2 = b^2 + c^2 - 2bc\cos A$	IN THE BOOKLET

Area of a triangle Any triangle ABC. C is the angle between sides a and b.	$\text{Area} = \frac{1}{2}ab\sin C$	IN THE BOOKLET

Compound interest

Total accrued P is the principal, r is the interest rate over a given period (as a percentage) and n is the number of times the interest is compounded.	$\text{Total accrued} = P\left(1+\frac{r}{100}\right)^n$	IN THE BOOKLET

Probability

Addition rule P(A) is the probability of outcome A and P(B) of outcome B. For mutually exclusive events the last term is zero.	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$	IN THE BOOKLET
Conditional probability Rearrange to find P(A given B).	$P(A \text{ and } B) = P(A \text{ given } B)\,P(B)$	IN THE BOOKLET

Given in the question, not on the sheet

AQA's specification says these are given in the relevant question, so look for them in the question stem. You do not need to memorise them.

Curved surface area of a cone r is the radius and l is the slant height.	$A = \pi rl$	SEE NOTE
Surface area of a sphere r is the radius.	$A = 4\pi r^2$	SEE NOTE
Volume of a sphere r is the radius.	$V = \frac{4}{3}\pi r^3$	SEE NOTE
Volume of a cone h is the perpendicular height.	$V = \frac{1}{3}\pi r^2 h$	SEE NOTE
Kinematics: velocity a is constant acceleration, u initial velocity, v final velocity, t time taken.	$v = u + at$	SEE NOTE
Kinematics: displacement s is displacement from the position when t = 0.	$s = ut + \frac{1}{2}at^2$	SEE NOTE
Kinematics: velocity and displacement No time term, so use it when t is not given or needed.	$v^2 = u^2 + 2as$	SEE NOTE

Learn these: not in the booklet

Area of a triangle

$A = \frac{1}{2}bh$

Area of a parallelogram

$A = bh$

Arc length

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

Area of a sector

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

Exact trig values

$\sin 30^\circ = \frac{1}{2},\ \cos 60^\circ = \frac{1}{2},\ \sin 45^\circ = \cos 45^\circ = \frac{\sqrt{2}}{2},\ \sin 60^\circ = \cos 30^\circ = \frac{\sqrt{3}}{2},\ \tan 45^\circ = 1,\ \tan 60^\circ = \sqrt{3}$

Speed, density, pressure

$\text{speed} = \frac{\text{distance}}{\text{time}},\ \text{density} = \frac{\text{mass}}{\text{volume}},\ \text{pressure} = \frac{\text{force}}{\text{area}}$

Simple interest

$$I = \frac{Prt}{100}$$

Percentage change

$$\frac{\text{new} - \text{old}}{\text{old}} \times 100$$

Independent events

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

Probability of not A

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

Mean from a frequency table

$$\bar{x} = \frac{\sum fx}{\sum f}$$

Interior angle sum of a polygon

$$(n - 2) \times 180^\circ$$

Exterior angle of a regular polygon

$$\frac{360^\circ}{n}$$

Straight line

$$y = mx + c, \quad m_1 m_2 = -1 \text{ for perpendicular lines}$$

Difference of two squares

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

Similar shapes

$$\text{area scale factor } k^2, \quad \text{volume scale factor } k^3$$

Circle centred on the origin

$$x^2 + y^2 = r^2$$

Using the booklet in the exam

- Open the insert at the start of the paper and note what is printed, so you do not waste time recalling it.
- Label the triangle with opposite, adjacent and hypotenuse before using the sheet's a, b and c ratios.
- Check the sine and cosine rules are matched to the correct sides: capital A is opposite lowercase a.
- For compound interest, make n match the compounding period: 3 years of yearly interest is n = 3, but monthly is n = 36.
- Cone, sphere and kinematics formulae appear in the question stem, so read it before trying to recall them.

Based on: AQA GCSE Mathematics 8300 (Higher tier), Formulae Sheet insert, exams in 2024; AQA GCSE Mathematics 8300 specification, Appendix: mathematical formulae. Statistical tables are calculated by CuratedPrep to the same layout. Updated 31 October 2026. Always practise with the version of the official booklet your exam uses. More free sheets and topic worksheets at curatedprep.com.