

IGCSE maths formula sheet: what the exam gives you, both boards

Cambridge 0580: the list of formulas printed on page 2 of every paper (from 2025)

Given on all papers (Core and Extended)	
Area of a triangle, base b , height h	$A = \frac{1}{2} b h$
Area of a circle of radius r	$A = \pi r^2$
Circumference of a circle of radius r	$C = 2 \pi r$
Curved surface area of a cylinder, radius r , height h	$A = 2 \pi r h$
Curved surface area of a cone, radius r , sloping edge l	$A = \pi r l$
Surface area of a sphere of radius r	$A = 4 \pi r^2$
Volume of a prism, cross-sectional area A , length l	$V = A l$
Volume of a pyramid, base area A , height h	$V = \frac{1}{3} A h$
Volume of a cylinder, radius r , height h	$V = \pi r^2 h$
Volume of a cone, radius r , height h	$V = \frac{1}{3} \pi r^2 h$
Volume of a sphere of radius r	$V = \frac{4}{3} \pi r^3$
Given on Extended papers only (Papers 2 and 4)	
The quadratic formula, $ax^2 + bx + c = 0$, $a \neq 0$	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
The sine rule, triangle ABC	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
The cosine rule	$a^2 = b^2 + c^2 - 2bc \cos A$
Area of a triangle	$\text{Area} = \frac{1}{2} ab \sin C$

Not given by Cambridge: the trapezium, Pythagoras, the right-angled trig ratios, and everything on page 2. Papers 1 (Core) and 2 (Extended) are non-calculator from 2025; Papers 3 and 4 allow a calculator.

Edexcel 4MA1: the formulae sheet at the front of each paper

Foundation tier (1F, 2F)	
Area of a trapezium	$\frac{1}{2} (a + b) h$
Volume of a prism	area of cross section $\times$ length
Volume of a cylinder	$\pi r^2 h$
Curved surface area of a cylinder	$2 \pi r h$
Higher tier (1H, 2H): the four above, plus	
Sum to n terms of an arithmetic series	$S_n = \frac{n}{2} [2a + (n - 1)d]$
The quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
The sine rule; the cosine rule	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$; $a^2 = b^2 + c^2 - 2bc \cos A$
Area of a triangle	$\frac{1}{2} ab \sin C$
Volume and curved surface area of a cone	$\frac{1}{3} \pi r^2 h$; $\pi r l$
Volume and surface area of a sphere	$\frac{4}{3} \pi r^3$; $4 \pi r^2$

Not given by Edexcel: the area and circumference of a circle, the pyramid, Pythagoras, the trig ratios. Calculators are allowed on both 4MA1 papers.

What you must memorise: tick each one you can write from memory

Number

- [] Percentage change = change / original $\times 100$; simple interest = $P r t / 100$; compound growth: amount = $P (1 + r/100)^n$
- [] Standard form $a \times 10^n$ with $1 \leq a < 10$; upper and lower bounds: half the rounding unit either way
- [] Index laws: $a^m \times a^n = a^{(m+n)}$; $a^m / a^n = a^{(m-n)}$; $(a^m)^n = a^{(mn)}$; $a^0 = 1$; $a^{-n} = 1/a^n$; $a^{(1/n)}$ = nth root of a
- [] Surds: $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$; rationalise by multiplying top and bottom by the surd

Algebra

- [] Gradient = $(y_2 - y_1)/(x_2 - x_1)$; $y = mx + c$; parallel lines share m; perpendicular gradients multiply to -1
- [] Midpoint $((x_1 + x_2)/2, (y_1 + y_2)/2)$; distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- [] $a^2 - b^2 = (a + b)(a - b)$; completing the square; nth term of an arithmetic sequence $a + (n - 1)d$
- [] Direct proportion $y = kx$; inverse $y = k/x$; Edexcel Higher: d/dx of $a x^n = n a x^{(n-1)}$

Geometry and measure

- [] Pythagoras $a^2 + b^2 = c^2$; $\sin = \text{opp/hyp}$, $\cos = \text{adj/hyp}$, $\tan = \text{opp/adj}$
- [] Exact values: $\sin 30 = \cos 60 = 1/2$; $\sin 45 = \cos 45 = \sqrt{2}/2$; $\sin 60 = \cos 30 = \sqrt{3}/2$; $\tan 45 = 1$; $\tan 30 = 1/\sqrt{3}$; $\tan 60 = \sqrt{3}$
- [] Polygon angle sum $(n - 2) \times 180$; exterior angles sum to 360; parallelogram $b \times h$; trapezium $1/2 (a + b) h$ (Cambridge)
- [] Arc length = $\theta/360 \times 2 \pi r$; sector area = $\theta/360 \times \pi r^2$
- [] Circle theorems: semicircle 90; centre twice circumference; same segment equal; cyclic quadrilateral opposite angles 180; tangent perpendicular to radius; alternate segment
- [] Similar shapes: lengths $\times k$, areas $\times k^2$, volumes $\times k^3$; speed = distance/time; density = mass/volume; pressure = force/area

Statistics, probability, sets and functions

- [] Mean = sum / count (grouped: midpoints); median = middle value; range = largest - smallest
- [] $P(A \text{ or } B) = P(A) + P(B)$ if mutually exclusive; $P(A \text{ and } B) = P(A) \times P(B)$ if independent; tree diagrams multiply along, add across
- [] Sets (Cambridge Extended): $n(A \cup B) = n(A) + n(B) - n(A \cap B)$; complement A' ; composite $fg(x) = f(g(x))$; inverse by swapping x and y

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