STUDY FORMULA BOOKLET

Cambridge IGCSE Maths 0580 Core list of formulas

The Core list prints triangle area, circle formulae and surface area and volume of cylinder, cone, sphere, prism and pyramid. Learn rectangle, trapezium, Pythagoras and trigonometry yourself.

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

Based on the official **Cambridge IGCSE Mathematics 0580, List of formulas, printed in the question papers (from 2025)**, with what to learn and exam tips added by CuratedPrep.

Area and circumference

The first three formulas on the Core list.

Area of a triangle b is the base and h is the perpendicular height.	$A = \frac{1}{2}bh$	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
Circumference of a circle r is the radius. Equal to πd if you are given the diameter d.	$C = 2\pi r$	IN THE BOOKLET

Surface area

Cylinder and cone give the curved surface only.

Curved surface area of a cylinder r is the radius and h the height. The two flat circular ends are not included.	$A = 2\pi rh$	IN THE BOOKLET
Curved surface area of a cone r is the radius and l is the sloping edge (slant height), not the vertical height.	$A = \pi rl$	IN THE BOOKLET
Surface area of a sphere r is the radius.	$A = 4\pi r^2$	IN THE BOOKLET

Volume

Volume of a prism A is the cross-sectional area and l is the length. A prism is any solid with a uniform cross-section.	$V = Al$	IN THE BOOKLET
Volume of a pyramid A is the area of the base and h is the perpendicular height.	$V = \frac{1}{3}Ah$	IN THE BOOKLET
Volume of a cylinder r is the radius and h the height. A cylinder is a prism with a circular cross-section.	$V = \pi r^2 h$	IN THE BOOKLET
Volume of a cone r is the radius and h the perpendicular height, not the sloping edge.	$V = \frac{1}{3}\pi r^2 h$	IN THE BOOKLET
Volume of a sphere r is the radius.	$V = \frac{4}{3}\pi r^3$	IN THE BOOKLET

Given in the question, not on the list

The syllabus says the formulas for these rates are given in the question when needed, so read the question stem. You do not need to memorise them.

Density Units such as g/cm³ follow from the units of mass and volume.	$\text{density} = \dfrac{\text{mass}}{\text{volume}}$	SEE NOTE
Pressure Check the units given in the question, for example N/m².	$\text{pressure} = \dfrac{\text{force}}{\text{area}}$	SEE NOTE
Population density For example people per km².	$\text{population density} = \dfrac{\text{population}}{\text{area}}$	SEE NOTE

Learn these: not in the booklet

Area and perimeter of a rectangle

$A = lw, \qquad P = 2(l + w)$

Area of a parallelogram

$A = bh$

h is the perpendicular height, not the slanting side.

Area of a trapezium

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

a and b are the parallel sides and h is the distance between them. The syllabus does not give this on the list.

Cuboid volume and surface area

$V = lwh, \qquad \text{surface area} = 2(lw + lh + wh)$

Total surface area of a closed cylinder

$A = 2\pi rh + 2\pi r^2$

Add the two circular ends, each πr², to the curved area on the list.

Half of a sphere

$V = \frac{2}{3}\pi r^3, \qquad \text{total surface area} = 3\pi r^2$

Halve the sphere volume on the list. For the surface, halve the sphere area and add the flat circle πr².

Arc length and sector area

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

θ is the sector angle in degrees. Core sector angles are factors of 360.

Pythagoras' theorem

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

c is the hypotenuse, the side opposite the right angle. It is not on the Core list.

Right-angled trigonometry (SOHCAHTOA)

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

To find an angle use $\sin^{-1}$, $\cos^{-1}$ or $\tan^{-1}$. Give angles to 1 decimal place.

Speed, distance and time

$\text{speed} = \frac{\text{distance}}{\text{time}}, \quad \text{distance} = \text{speed} \times \text{time}, \quad \text{time} = \frac{\text{distance}}{\text{speed}}$

Average speed uses total distance divided by total time. The syllabus says this formula is not given.

Simple interest

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

P is the amount invested, R the yearly rate in percent and T the number of years.

Compound interest

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

r is the rate for each period and n is the number of periods. The amount includes the original money.

Percentage change

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

Percentage profit and loss use the same idea with cost price as the original.

Percentage multipliers

$\text{increase by } r\% : \times\left(1 + \frac{r}{100}\right), \qquad \text{decrease by } r\% : \times\left(1 - \frac{r}{100}\right)$

Sharing in a ratio

$\text{one part} = \frac{\text{amount}}{\text{total number of parts}}$

Multiply one part by each share. For 20 : 30 : 40 divide by the highest common factor to get 2 : 3 : 4.

Similar shapes

$\text{scale factor} = \frac{\text{new length}}{\text{old length}}$

Core only uses lengths of similar shapes, not areas or volumes.

Angle facts

$\text{at a point} = 360^\circ, \ \text{on a line} = 180^\circ, \ \text{triangle} = 180^\circ, \ \text{quadrilateral} = 360^\circ$

Vertically opposite angles are equal.

Angles in parallel lines

Corresponding angles are equal, alternate angles are equal and co-interior angles add to 180°. Give the correct name as the reason.

Polygon angles

$$\text{angle sum} = (n-2) \times 180^\circ, \qquad \text{exterior angle (regular)} = \frac{360^\circ}{n}$$

Interior angle plus exterior angle is 180°.

Circle theorems in Core

The angle in a semicircle is 90°, and the angle between a tangent and the radius at the point of contact is 90°.

Straight-line graphs

$$y = mx + c, \qquad m = \frac{\text{change in } y}{\text{change in } x}$$

m is the gradient and c the y-intercept. Parallel lines have the same gradient. Core finds gradients from a grid.

Rules of indices

$$a^m \times a^n = a^{m+n}, \quad a^m \div a^n = a^{m-n}, \quad (a^m)^n = a^{mn}, \quad a^0 = 1, \quad a^{-n} = \frac{1}{a^n}$$

nth term of a linear sequence

$$T_n = dn + (a - d)$$

d is the common difference and a is the first term. Simple quadratic and cubic nth terms use n^2 and n^3, for example 2, 5, 10, 17 has nth term $n^2 + 1$.

Mean from a frequency table

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

Multiply each value by its frequency, add, then divide by the total frequency. Range is largest minus smallest.

Probability basics

$$P(\text{event}) = \frac{\text{favourable outcomes}}{\text{total outcomes}}, \qquad P(\text{not } A) = 1 - P(A)$$

Probabilities of all outcomes add to 1. Expected frequency is probability times the number of trials.

Combined events and tree diagrams

Multiply along the branches for 'and', and add the end outcomes you want. Core combined events are with replacement only.

Pie chart angle

$$\text{angle} = \frac{\text{frequency}}{\text{total}} \times 360^\circ$$

Bounds of rounded data

$$\text{lower} = x - \frac{u}{2}, \qquad \text{upper} = x + \frac{u}{2}$$

x is the rounded value and u is the unit it was rounded to, for example 10 for the nearest 10.

Metric conversions

$$1\text{ km} = 1000\text{ m},\ 1\text{ m} = 100\text{ cm},\ 1\text{ cm} = 10\text{ mm},\ 1\text{ kg} = 1000\text{ g},\ 1\text{ l} = 1000\text{ cm}^3,\ 1\text{ m}^3 = 1000\text{ l}$$

For area and volume square or cube the length factor: 1 m² = 10 000 cm² and 1 m³ = 1 000 000 cm³.

Bearings

Three figures, measured clockwise from north, for example 025°. The back bearing is the bearing plus or minus 180°.

Using the booklet in the exam

- Open page 2 at the start of Paper 1 and Paper 3 and note what is printed, so you never waste time recalling it.
- Only the triangle area is printed, so write down rectangle, parallelogram and trapezium areas on your revision card.
- For a cone, use the sloping edge l in the curved surface area but the vertical height h in the volume.
- Pythagoras and SOHCAHTOA are not printed on the Core list: label opposite, adjacent and hypotenuse before choosing a ratio.
- If a question asks for the answer in terms of π, keep π in your working and do not use 3.14 until the end.

Based on: Cambridge IGCSE Mathematics 0580 (Core), List of formulas, page 2 of Paper 1 and Paper 3, printed in the question papers from 2025; Cambridge IGCSE Mathematics 0580 syllabus for 2025, 2026 and 2027, Details of the assessment: List of formulas, Core. 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.