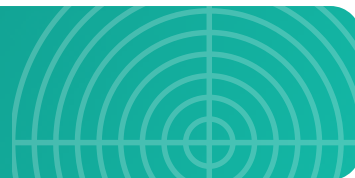


Geometry

Cambridge IGCSE Maths (0580) · Knowledge organiser



KEY DEFINITIONS

Alternate angles

Equal angles on opposite sides of a line crossing two parallel lines (a Z shape).

Exterior angle

The angle between one side of a polygon and the next side extended; they add to 360° .

Similar shapes

Same shape, different size: all lengths are multiplied by the same scale factor.

Tangent to a circle

A line touching the circle at one point; it is perpendicular to the radius there.

YOU SHOULD BE ABLE TO...

- Use geometrical terms for angles, lines, polygons, the parts of a circle and solids correctly when describing shapes and solving problems.
- Use angle facts for lines, points, triangles and quadrilaterals to find missing angles, giving a geometric reason for each step.
- Use the scale factor of similar shapes to calculate missing lengths, including triangles that share an angle or have parallel sides.
- Use the circle properties of chords equidistant from the centre and of equal tangents from an external point, together with symmetry, to find lengths and angles.
- Solve problems and give simple explanations involving similarity.
- Identify planes of symmetry and axes of rotational symmetry of prisms, cylinders, pyramids and cones.

COMMON MISTAKES

- ✗ Map scales: not converting centimetres to kilometres
- ✗ Bearings: the wrong angle, or measured from the wrong line

KEY FORMULAS

Angles: on a straight line 180° ; around a point 360° ; in a triangle 180°

Polygons (n sides)	interior sum = $(n - 2) \times 180^\circ$ exterior angle (regular) = $\frac{360^\circ}{n}$
-----------------------	---

Circle theorems: angle in a semicircle = 90° ; tangent $\perp$ radius

More circle theorems: angle at centre = $2 \times$ angle at circumference; angles in the same segment are equal; opposite angles of a cyclic quadrilateral sum to 180° ; alternate segment theorem; tangents from a point are equal; the perpendicular bisector of a chord passes through the centre

Similar shapes, scale factor k : lengths $\times k$

Similar shapes: areas $\times k^2$, volumes $\times k^3$

WORKED EXAMPLE

Find the size of each interior angle of a regular octagon.

1. Exterior angle = $360^\circ \div 8 = 45^\circ$

2. Interior angle = $180^\circ - 45^\circ$

Answer: 135°

