

Exercise walk-through

E4.1

Geometrical terms

IGCSE Mathematics

You must be able to

- name a shape or a part of a circle precisely, using the correct mathematical word
- use the interior and exterior angle rules for a polygon
- state what congruent and similar mean about sides and angles

1

The method

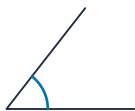
Method — The right word is the mark

- **Polygons:** interior angle sum = $(n - 2) \times 180^\circ$; each exterior angle of a REGULAR polygon = $\frac{360^\circ}{n}$, and interior + exterior = 180° .
- **Triangles:** equilateral (all equal), isosceles (two equal), scalene (all different).
- **Quadrilaterals:** a **trapezium** has exactly one pair of parallel sides; a **rhombus** has four equal sides; a **kite** has two pairs of adjacent equal sides.
- **Congruent** means same shape AND same size; **similar** means same shape, one an enlargement of the other, so angles are equal and sides are in the same ratio.

Answer shapes (marked by **method marks** — M1 for a correct method, A1 for the correct answer): naming questions are single B marks — the exact word or nothing.

Method — The right word is the mark

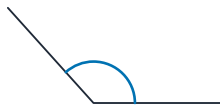
Answer shapes (marked by method marks — M1 for a correct method, A1 for the correct answer): naming questions...



acute
 $< 90^\circ$



right
 $= 90^\circ$



obtuse
 $90^\circ - 180^\circ$

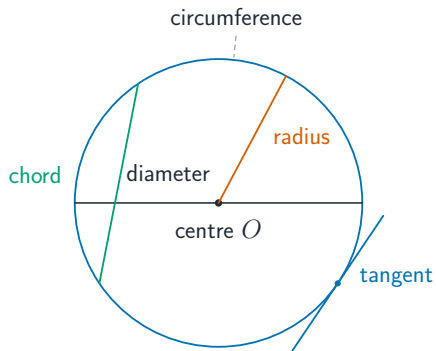


reflex
 $180^\circ - 360^\circ$

The types of angle, from acute to reflex

Method — The right word is the mark

Answer shapes (marked by method marks — M1 for a correct method, A1 for the correct answer): naming questions...



The named parts of a circle

2

Practice

Practice 2.1 ■ 1 mark

Write down the type of angle that measures 215° .

Solution 2.1

Method: The right word is the mark — p.4

Worked steps

- it is greater than 180°

reflex

B1

Practice 2.2 ■ 2 marks

A polygon has 8 sides. Write down its name, and find the sum of its interior angles.

Solution 2.2

Method: The right word is the mark — p.4

Worked steps

- 8 sides is an **octagon** B1

$$(8 - 2) \times 180 = 1080^\circ$$

B1

Practice 2.3 ■ 2 marks

Write down the mathematical name for (a) a line from the centre of a circle to the circumference, and (b) a line joining two points on the circumference.

Solution 2.3

Worked steps

- (a) **radius** **B1**
- (b) **chord** — a diameter is the special chord that passes through the centre
B1

3

Exam-style

Exam-style 3.1 ■ 3 marks

A regular polygon has an exterior angle of 24° .

Exam-style 3.1 (a) ■ 2 marks

Find the number of sides.

Solution 3.1 (a)

Method: The right word is the mark — p.4

Worked steps

- the exterior angles of any polygon add to 360° , so $360 \div 24$ **M1**

$$= 15$$

A1

Exam-style 3.1 (b) ■ 1 mark

Find the size of each interior angle.

Solution 3.1 (b)

Worked steps

$$\blacksquare \text{ interior} = 180 - 24$$

$$= 156^\circ$$

B1

Exam-style 3.2 ■ 3 marks

Write down the mathematical name for each of the following.

Exam-style 3.2 (a) ■ 1 mark

A quadrilateral with exactly one pair of parallel sides.

Exam-style 3.2 (b) ■ 1 mark

A triangle with all three sides of different lengths.

Exam-style 3.2 (c) ■ 1 mark

A solid with two parallel circular faces joined by a curved surface.

Solution 3.2

Method: The right word is the mark — p.4

Worked steps

- (a) trapezium **B1**
- (b) scalene **B1**
- (c) cylinder **B1**

Exam-style 3.3 ■ 2 marks

Two shapes are congruent. State what this tells you about their sides and their angles.

Solution 3.3

Method: The right word is the mark — p.4

Worked steps

- corresponding sides are equal in length **B1**
- corresponding angles are equal, so the shapes are identical in size as well as shape **B1**
- note that similar shapes have equal angles but sides in a fixed ratio, which is the weaker condition