Your notes

GCSE Maths: revision notes

Polygons and their angles

Contents

1. Names and types
2. Interior angles
3. Exterior angles
4. Quadrilaterals
5. Worked examples
6. Key terms
7. Quick questions
8. What to do next

Names and types

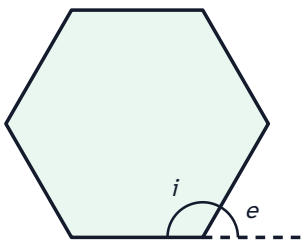
- A **polygon** is a flat shape with straight sides: triangle (3 sides), quadrilateral (4), **pentagon** (5), **hexagon** (6), heptagon (7), octagon (8), nonagon (9) and decagon (10).
- A **regular polygon** has all its sides equal and all its angles equal.

Interior angles

- The **interior angles** of a **polygon** with n sides add up to (n – 2) × 180°.
- A **hexagon**'s angles add up to 4 × 180 = 720°. Each angle of a regular **hexagon** is 720 ÷ 6 = 120°.

Exterior angles

- The **exterior angles** of any **polygon** add up to 360°.
- Each **exterior angle** of a **regular polygon** is 360° ÷ n. The interior and **exterior angles** at a corner add up to 180°.
- To find the number of sides of a **regular polygon**, work out n = 360 ÷ **exterior angle**. An **interior angle** of 144° means an exterior angle of 36°, so n = 10.

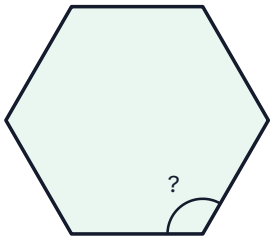


Quadrilaterals

- A parallelogram has opposite sides parallel and equal, and opposite angles equal. A rhombus is a parallelogram with four equal sides.
- A **trapezium** has exactly one pair of parallel sides. A kite has two pairs of equal sides next to each other.

Worked examples

Find the interior angle of a regular hexagon



The exterior angles of any polygon add up to 360°. A hexagon has 6. **360 ÷ 6 = 60°**

Interior and exterior angles add up to 180° (they're on a straight line). **180 − 60 = 120**

Answer: 120°

Key terms

Polygon	A flat shape with straight sides.
Regular polygon	A polygon with all sides equal and all angles equal.
Interior angle	An angle inside a polygon at one of its corners.
Exterior angle	The angle between one side of a polygon and the next side extended.
Pentagon	A polygon with 5 sides.
Hexagon	A polygon with 6 sides.
Octagon	A polygon with 8 sides.
Trapezium	A quadrilateral with exactly one pair of parallel sides.

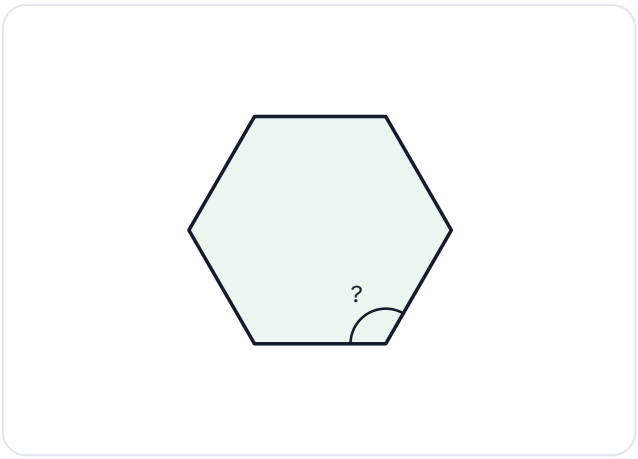
Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

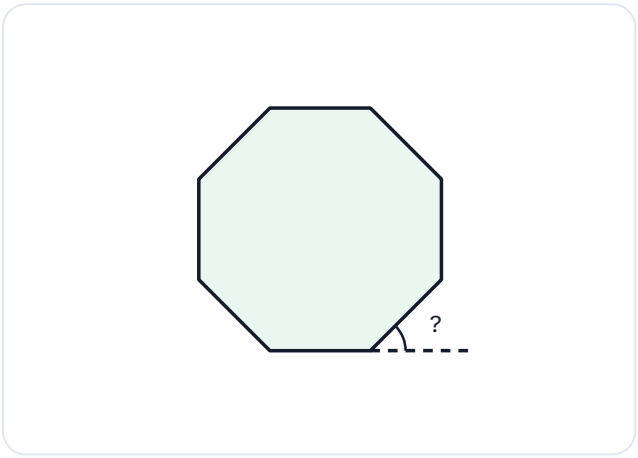
1. What is the sum of the interior angles of a pentagon?

Your notes

2. What is each interior angle of a regular hexagon?



3. What do the exterior angles of any polygon add up to?
4. What is each exterior angle of a regular octagon?



5. A regular polygon has exterior angles of 36°. How many sides does it have?
6. A regular polygon has interior angles of 150°. How many sides does it have?
7. How many sides does a heptagon have?
8. What is a regular polygon?

Answers

1. 540°
2. 120°
3. 360°
4. 45°
5. 10
6. 12
7. 7
8. A polygon with all sides and all angles equal

What to do next

Practise 12 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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