

Angles in 2D Shapes

Maths

Level 2

Exam-style practice · 12 questions · 26 marks · Non-calculator

Remember

On a straight line: add to 180° . **Around a point:** add to 360° . **Vertically opposite** angles are equal.

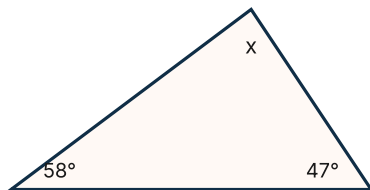
Triangle: angles add to 180° . Isosceles: two equal sides, two equal angles. Equilateral: all 60° . Right angle = 90° .

Quadrilateral: angles add to 360° . Rectangle: four right angles. Parallelogram: opposite angles equal.

Regular polygon: each interior angle = $(n - 2) \times 180 \div n$. Hexagon 120° , pentagon 108° , octagon 135° . Exterior angle = $360 \div n$.

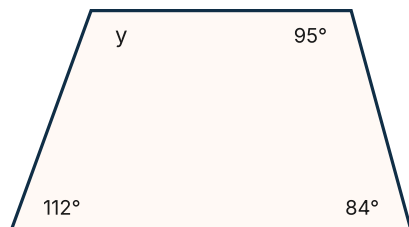
Section A – Angle facts

1. Find angle x . Give a reason.



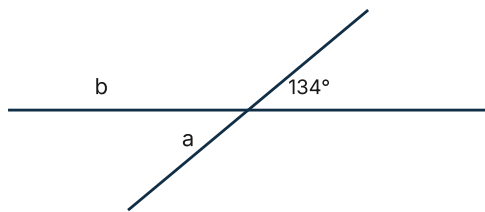
(2 marks)

2. Find angle y . Give a reason.



(2 marks)

3. Two straight lines cross. Find angles a and b, giving reasons.



(3 marks)

4. An isosceles triangle has one angle of 40° between its two equal sides. Find the other two angles. (2 marks)

5. Three angles around a point are 115° , 90° and 87° . Find the fourth. (1 mark)

Section B – In context

6. A roof truss is an isosceles triangle. The two sloping sides meet at 116° . What angle does each sloping side make with the horizontal base? (2 marks)

7. A wheelchair ramp makes an angle of 4.8° with the ground. What angle does it make with the vertical wall it leads up to? (2 marks)

8. Floor tiles are regular hexagons. (a) What is each interior angle? (b) Explain why three hexagons fit together around a point with no gap. (3 marks)

9. A regular octagonal gazebo has 8 sides. What is each interior angle? What is the angle at the centre between two adjacent corner posts? (3 marks)

10. A pizza is cut into 5 equal slices, then one slice is cut in half. What is the angle at the point of a half-slice? (2 marks)

11. The angles of a quadrilateral garden bed are 90° , 90° , 125° and x° . Find x . What kind of quadrilateral could it be? (2 marks)

12. A clock shows 4 o'clock. What is the smaller angle between the hands? (2 marks)

Angles in 2D Shapes – Answers

Level 2 · Working shown so you can check your method, not just the final number.

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Section A

1. $180 - 58 - 47 = 75^\circ$ (angles in a triangle add to 180°).
2. $360 - 112 - 84 - 95 = 69^\circ$ (angles in a quadrilateral add to 360°).
3. $a = 180 - 134 = 46^\circ$ (angles on a straight line). $b = 134^\circ$ (vertically opposite the given angle).
4. $(180 - 40) \div 2 = 70^\circ$ each.
5. $360 - 292 = 68^\circ$.

Section B

6. $(180 - 116) \div 2 = 32^\circ$.
7. $90 - 4.8 = 85.2^\circ$.
8. (a) $(6 - 2) \times 180 \div 6 = 120^\circ$. (b) $3 \times 120^\circ = 360^\circ$, a full turn, so there is no gap and no overlap.
9. $(8 - 2) \times 180 \div 8 = 135^\circ$. Centre angle = $360 \div 8 = 45^\circ$.
10. $360 \div 5 = 72^\circ$; half is 36° .
11. $360 - 305 = 55^\circ$. A trapezium (two right angles, the other two adding to 180°).
12. Each hour is 30° ; 4 hours = 120° .

Where Level 2 students lose marks on this topic

- Giving the number without the reason – 'angles in a triangle add to 180° ' is worth a mark on its own.
- Using 180° for a quadrilateral or 360° for a triangle.
- Assuming a triangle is isosceles or right-angled because it looks it. Only use what the question states or marks.