FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

G3: Angle facts

Prove and reason with angle facts in lines, triangles and polygons

20 marks · 25 minutes · Non-calculator

1) Draw a line parallel to one side of a triangle to prove that the angles in a triangle add up to 180°.

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[Question 1: 3 marks]

2) Explain why co-interior angles between parallel lines add up to 180°.

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[Question 2: 2 marks]

3) Explain why each interior angle of a regular pentagon is 108°.

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[Question 3: 2 marks]

4) Explain why a regular polygon cannot have an exterior angle of 50°.

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[Question 4: 2 marks]

5) By splitting a hexagon into triangles, show that its interior angles add up to 720°.

[Question 5: 2 marks]

6) Prove that vertically opposite angles are equal.

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[Question 6: 2 marks]

7) Can a triangle have angles of 95° and 90°? Explain.

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[Question 7: 1 marks]

8) Show that each exterior angle of a regular octagon is 45° and each interior angle is 135°.

[Question 8: 2 marks]

9) Explain why the angles around a point add up to 360°.

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[Question 9: 1 marks]

10) Kim says the angles in a quadrilateral add up to 180°. Explain her mistake.

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[Question 10: 2 marks]

11) Show that a regular polygon with interior angles of 150° has 12 sides.

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[Question 11: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Proof	Alternate angles equal (M1, M1); angles on a straight line sum to 180° (C1).
2	Explanation	Corresponding angle and angles on a straight line (C2).
3	Explanation	Sum = 3 × 180 = 540 (M1); 540 ÷ 5 (C1).
4	Explanation	360 ÷ 50 = 7.2 (M1); not a whole number of sides (C1).
5	Shown	4 triangles (M1); 4 × 180 (C1).
6	Proof	Each pair with the same neighbour sums to 180° (M1); C1.
7	No	95 + 90 > 180 (C1).
8	Shown	360 ÷ 8 = 45 (M1); 180 − 45 (C1).
9	Explanation	A full turn (C1).
10	360°	Two triangles (C1); B1.
11	Shown	Exterior 30°, 360 ÷ 30 = 12 (C1).