FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G4: Properties of shapes

Reason about the properties of quadrilaterals and triangles

20 marks · 25 minutes · Non-calculator

1) Explain why every square is a rectangle, but not every rectangle is a square.

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[Question 1: 2 marks]

2) Explain why the diagonals of a rhombus cross at right angles.

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[Question 2: 2 marks]

3) Jo says a trapezium cannot have a right angle. Explain why she is wrong.

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[Question 3: 2 marks]

4) Explain why the diagonals of a kite are perpendicular.

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[Question 4: 2 marks]

5) Is a quadrilateral with four equal sides always a square? Explain.

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[Question 5: 2 marks]

6) One angle of a parallelogram is 70°. Explain why its angles are 70°, 110°, 70° and 110°.

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[Question 6: 2 marks]

7) Explain why the base angles of an isosceles triangle are equal.

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[Question 7: 2 marks]

8) Explain why every angle of an equilateral triangle is 60°.

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[Question 8: 2 marks]

9) The diagonals of a quadrilateral bisect each other. What type of quadrilateral must it be? Explain.

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[Question 9: 2 marks]

10) Explain why a triangle cannot have two obtuse angles.

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[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Explanation	A square has 4 right angles and opposite sides equal (C1); a rectangle need not have 4 equal sides (C1).
2	Explanation	Diagonals form congruent triangles (SSS) (C1); angles at the centre equal and sum to 180° (C1).
3	Explanation	e.g. a right-angled trapezium has one side perpendicular to the parallel sides (C2).
4	Explanation	The line of symmetry is one diagonal (C1); the other diagonal is reflected onto itself, so meets at 90° (C1).
5	No	It could be a rhombus (C2).
6	Explanation	Co-interior angles: $180 - 70 = 110$ (C1); opposite angles equal (C1).
7	Explanation	Line of symmetry / congruent halves (C2).
8	Explanation	All angles equal (C1); $180 \div 3$ (C1).
9	Parallelogram	Explanation: opposite sides equal by congruent triangles (C2).
10	Explanation	Two angles over 90° already exceed 180° (C2).