FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G1: Shape properties and symmetry

Reason about polygons, notation and symmetry

20 marks · 25 minutes · Non-calculator

1) Explain why a square is a regular polygon but a rectangle that is not a square is not.

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[Question 1: 2 marks]

2) Kim says a rhombus has 4 lines of symmetry. Explain her mistake.

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[Question 2: 2 marks]

3) Explain why a regular hexagon has rotational symmetry of order 6

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[Question 3: 2 marks]

4) Explain the difference between parallel lines and perpendicular lines.

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[Question 4: 2 marks]

5) Is every equilateral triangle also isosceles? Explain.

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[Question 5: 2 marks]

6) Explain why a parallelogram that is not a rectangle or rhombus has no lines of symmetry.

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[Question 6: 2 marks]

7) A quadrilateral has 4 lines of symmetry. Explain why it must be a square.

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[Question 7: 2 marks]

8) Explain why we use three letters, such as $\angle ABC$, to name an angle.

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[Question 8: 2 marks]

9) A regular polygon has rotational symmetry of order 8. Explain how many sides and lines of symmetry it has.

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[Question 9: 2 marks]

10) Explain why a kite has exactly one line of symmetry.

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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	Square: all sides and angles equal (C1); rectangle sides not all equal (C1).
2	2	Folding along a line through the middle of a side does not match (C1); only the diagonals (B1).
3	Explanation	It looks the same after each turn of 60° (M1); 360 ÷ 60 = 6 (C1).
4	Explanation	Parallel never meet (C1); perpendicular meet at 90° (C1).
5	Yes	It has (at least) two equal sides (C2).
6	Explanation	No fold matches sides and angles, e.g. diagonals give a different shape (C2).
7	Explanation	Lines through midpoints and diagonals need equal sides and right angles (C2).
8	Explanation	The middle letter is the vertex; the outer letters give the arms (C2).
9	8 and 8	Regular polygon with n sides has order n (C1); and n lines (C1).
10	Explanation	Only the line through the two vertices between equal sides (C2).