FOUNDATION & HIGHER

HIGHER EXTENDS

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

G7: Transformations

Reason about reflections, rotations, translations and enlargements

20 marks · 25 minutes · Non-calculator

1) Explain why reflections, rotations and translations always give congruent images.

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[Question 1: 2 marks]

2) Explain why "a rotation of 90°" is not a full description of a rotation.

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[Question 2: 2 marks]

3) Explain the effect of an enlargement with scale factor −2.

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[Question 3: 2 marks]

4) Ben says an enlargement with scale factor $\frac{1}{2}$ makes a shape bigger. Explain his mistake.

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[Question 4: 1 marks]

5) Show that (4, 6) enlarged by scale factor $\frac{1}{2}$, centre (0, 0), goes to (2, 3).

[Question 5: 2 marks]

6) Explain how to find the centre of an enlargement from a shape and its image.

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[Question 6: 2 marks]

7) Show that reflecting (3, 1) in the line $y = x$ gives (1, 3).

[Question 7: 2 marks]

8) Explain why a rotation of 180° about the origin is the same as an enlargement with scale factor −1, centre the origin.

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[Question 8: 2 marks]

9) Explain why the angles of a shape do not change when it is enlarged.

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[Question 9: 2 marks]

10) A triangle of area 6 cm^2 is enlarged by scale factor 3. Show that the image has area 54 cm^2.

[Question 10: 2 marks]

11) Explain how to find the mirror line between a shape and its reflection.

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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	Explanation	Lengths and angles are unchanged (C2).
2	Explanation	Direction and centre needed (C2).
3	Explanation	Twice as large (C1); on the opposite side of the centre, upside down (C1).
4	Explanation	Lengths are halved (C1).
5	Shown	Halve each coordinate (M1); C1.
6	Explanation	Join corresponding vertices (C1); extend lines to meet (C1).
7	Shown	Coordinates swap (M1); C1.
8	Explanation	Both send (x, y) to $(-x, -y)$ (C2).
9	Explanation	Enlargement keeps shape (similar), only size changes (C2).
10	Shown	Area factor 3^2 (M1); C1.
11	Explanation	Perpendicular bisector of a point and its image (C1).