FOUNDATION & HIGHER

HIGHER EXTENDS

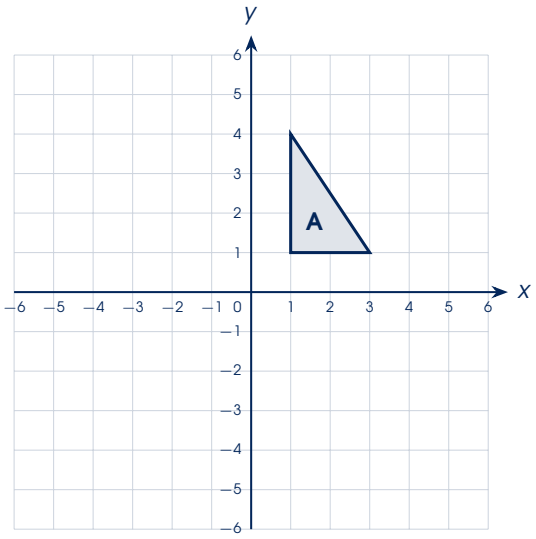
Name ..... Class .....

G7: Transformations

Reflections, rotations, translations and enlargements (including fractional and negative scale factors)

20 marks · 25 minutes · Non-calculator

1) Shape *A* is drawn on the grid.



(a) Reflect shape *A* in the *y*-axis. Label the image *B*.

(2)

(b) Rotate shape *A* 90° clockwise about the origin. Label the image *C*.

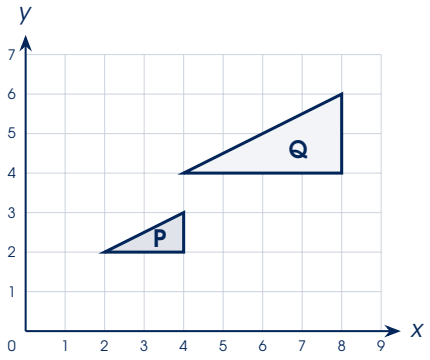
(2)

(c) Translate shape *A* by the vector $\begin{pmatrix} -4 \\ -5 \end{pmatrix}$. Label the image *D*.

(2)

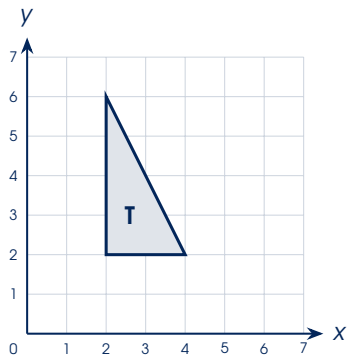
[Question 1: 6 marks]

2) Describe fully the single transformation that maps shape *P* onto shape *Q*.



[Question 2: 3 marks]

3) Enlarge triangle T by scale factor $\frac{1}{2}$, centre $(0, 0)$.



[Question 3: 2 marks]

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4) A shape has a vertex at $(2, 5)$. The shape is reflected in the line $y = x$. Where does this vertex end up?

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[Question 4: 1 marks]

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5) The point $(3, -2)$ is enlarged by scale factor -1, centre $(0, 0)$. Where does it end up?

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[Question 5: 1 marks]

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6) The point $(2, 3)$ is enlarged by scale factor 3, centre $(1, 1)$. Where does it end up?

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[Question 6: 2 marks]

7) Which of these transformations can change the size of a shape: reflection, rotation, translation, enlargement?

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[Question 7: 1 marks]

8) The point $(-4, 1)$ is rotated 180° about $(0, 0)$. Where does it end up?

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[Question 8: 1 marks]

9) The point $(3, 4)$ is reflected in the line $x = 1$. Where does it end up?

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[Question 9: 1 marks]

10) A translation maps $(2, -3)$ onto $(-1, 4)$. Write the translation as a column vector.

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[Question 10: 1 marks]

11) A shape is enlarged by scale factor $\frac{1}{2}$. What happens to the lengths of its 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	(a) B: $(-1,1)$, $(-3,1)$, $(-1,4)$ (b) C: $(1,-1)$, $(1,-3)$, $(4,-1)$ (c) D: $(-3,-4)$, $(-1,-4)$, $(-3,-1)$	Each part: B2 for correct, B1 for correct orientation in the wrong place or 2 vertices correct.
2	Enlargement, scale factor 2, centre $(0,0)$	B1 each of the three parts.
3	$(1,1)$, $(2,1)$, $(1,3)$	B2 (B1 for correct size in the wrong place).
4	$(5,2)$	B1.
5	$(-3,2)$	B1.
6	$(4,7)$	Vector from centre $(1,2)$ tripled (M1); A1.
7	enlargement	B1.
8	$(4,-1)$	B1.
9	$(-1,4)$	B1.
10	$\begin{pmatrix} -3 \\ 7 \end{pmatrix}$	B1.
11	They are halved	B1.