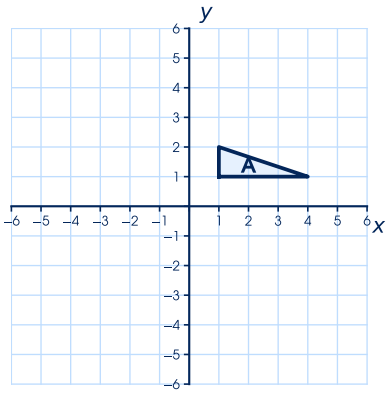
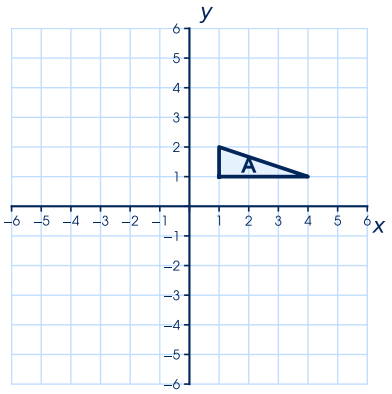
GCSE HIGHER · REVISION MAT 5

Combining transformations

1 Translate A by (−2, 3), then reflect the image in the y-axis.



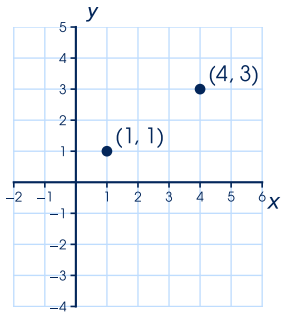
2 Reflect A in $y = -x$, then translate the image by (1, 1).



3 Show that reflecting in the x-axis and then in $y = x$ is a rotation of 90° anticlockwise about O.

4 The point (4, 3) is rotated 90° clockwise about (1, 1), and then reflected in the x-axis.

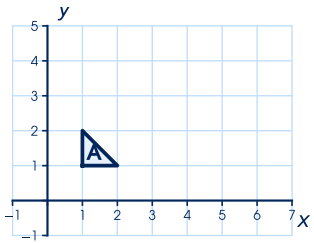
Find the final point.



5 Which single transformation reverses a rotation of 90° clockwise about O?

6 A shape is enlarged by scale factor 2, centre O, and then translated by (3, 0).

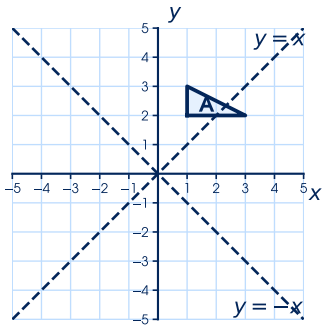
Show that this is a single enlargement and find its centre.



7 Show that two rotations of 180° about the same point return a shape to its start.

8 A shape is reflected in $y = x$ and then in $y = -x$.

Describe the single transformation and its invariant points.



ANSWERS · REVISION MAT 5

Combining transformations

1 Translate: $(-1, 4), (2, 4), (-1, 5)$

$(1, 4), (-2, 4), (1, 5)$

2 Reflect: $(-1, -1), (-1, -4), (-2, -1)$

$(0, 0), (0, -3), (-1, 0)$

3 $(x, y) \rightarrow (x, -y) \rightarrow (-y, x)$

Rotation 90° anticlockwise about O

4 Relative to centre: $(3, 2) \rightarrow (2, -3)$

Rotated point $(3, -2)$

$(3, 2)$

5 **A rotation of 90° anticlockwise about O**

6 $p \rightarrow 2p + (3, 0)$

$c + 2(p - c) = 2p - c \Rightarrow c = (-3, 0)$

Enlargement, scale factor 2, centre $(-3, 0)$

7 **Total turn 360° about the same point**

8 $(x, y) \rightarrow (y, x) \rightarrow (-x, -y)$

Rotation of 180° about O; only (0, 0) is invariant

Mr&Mrs MATHS