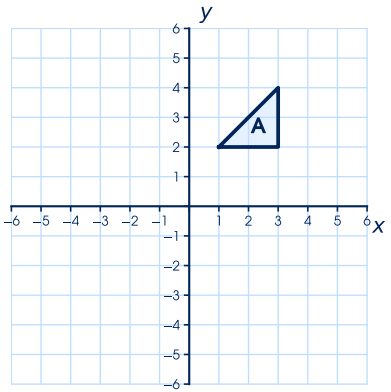
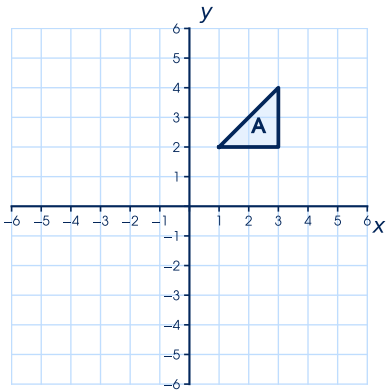
GCSE HIGHER · REVISION MAT 3

Combining transformations

1 Rotate A 180° about O, then translate the image by (2, 2).

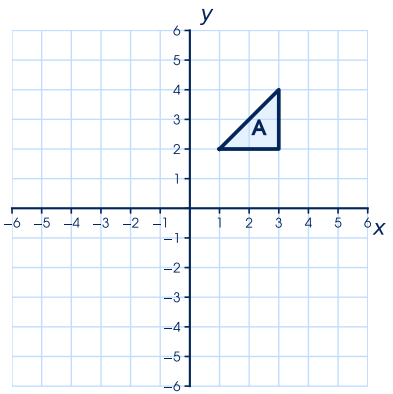


2 Reflect A in the *y*-axis, then reflect the image in the *x*-axis.



3 Show that reflecting in the *y*-axis and then the *x*-axis is the same as a rotation of 180° about O.

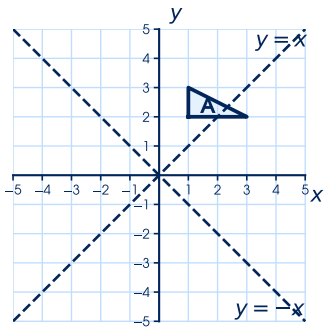
4 Reflect A in the *x*-axis, then rotate the image 90° clockwise about O.



5 Explain why 'translate then reflect' may give a different result from 'reflect then translate'.

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

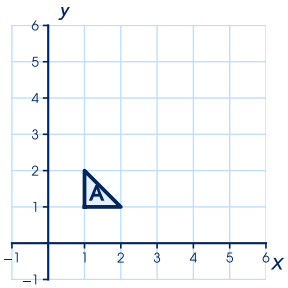
Describe the single transformation.



7 Show that an enlargement by scale factor −1, centre O, is the same as a rotation of 180° about O.

8 A shape is enlarged by scale factor 2, centre O, then by scale factor $\frac{1}{2}$, centre (2, 0).

Describe the single transformation.



Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

Combining transformations

1 Rotate: (−1, −2), (−3, −2), (−3, −4)

(1, 0), (−1, 0), (−1, −2)

2 **(−1, −2), (−3, −2), (−3, −4)**

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

Rotation of 180° about O

4 Reflect: (1, −2), (3, −2), (3, −4)

Rotate: (−2, −1), (−2, −3), (−4, −3)

5 **The translation moves the shape relative to the mirror line, so order changes the result.**

6 $(x, y) \rightarrow (-y, -x) \rightarrow (-x, -y)$

Rotation of 180° about O

7 **Both map (x, y) to $(-x, -y)$.**

8 $p \rightarrow 2p$

then $\rightarrow (2, 0) + \frac{1}{2}(2p - (2, 0))$

$= p + (1, 0)$

Translation by (1, 0)