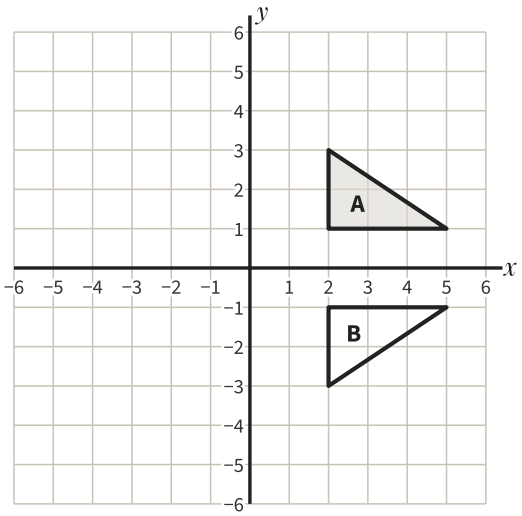
Combined transformations

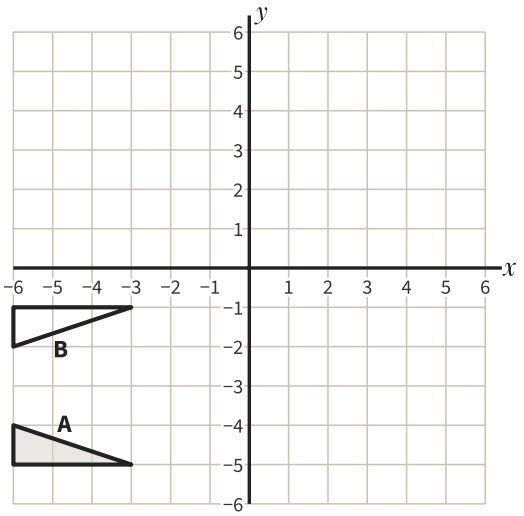
1



1. Reflect A in the x axis. Label it B. (Done for you.)
2. Reflect B in the y axis. Label it C.
3. Describe fully the **single** transformation that maps A onto C.

reflection **rotation** **translation**

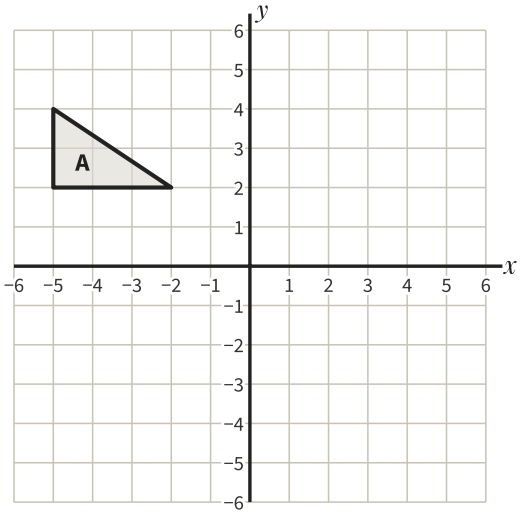
2



1. Reflect A in the line $y = -3$. Label it B. (Done for you.)
2. Reflect B in the line $y = 1$. Label it C.
3. Describe fully the **single** transformation that maps A onto C.

reflection **rotation** **translation**

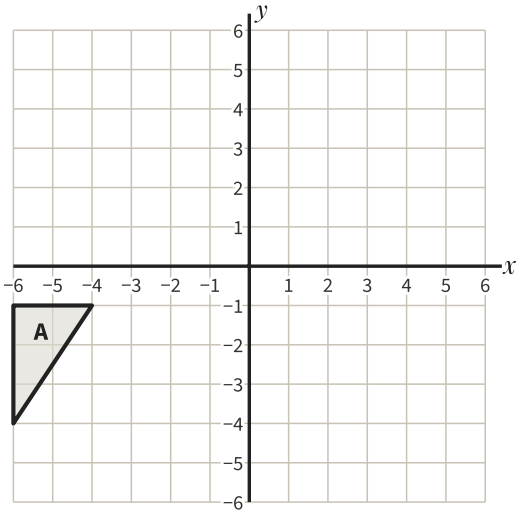
3



1. Rotate A **90° clockwise** about (0, 0). Label it B.
2. Rotate B **90° clockwise** about (0, 0). Label it C.
3. Describe fully the **single** transformation that maps A onto C.

reflection **rotation** **translation**

4

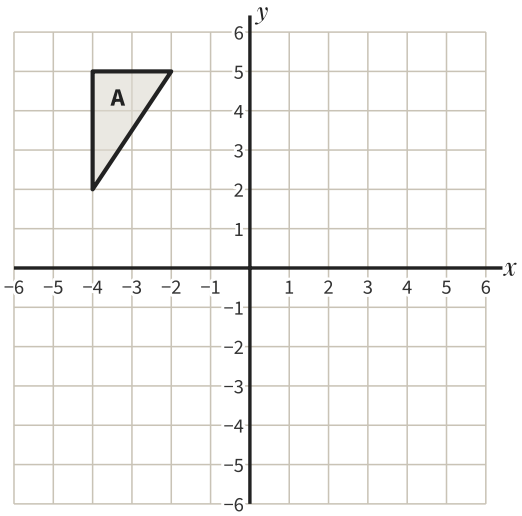


1. Translate A by the vector $\begin{pmatrix} 1 \\ 6 \end{pmatrix}$. Label it B.
2. Translate B by the vector $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$. Label it C.
3. Describe fully the **single** transformation that maps A onto C.

reflection **rotation** **translation**

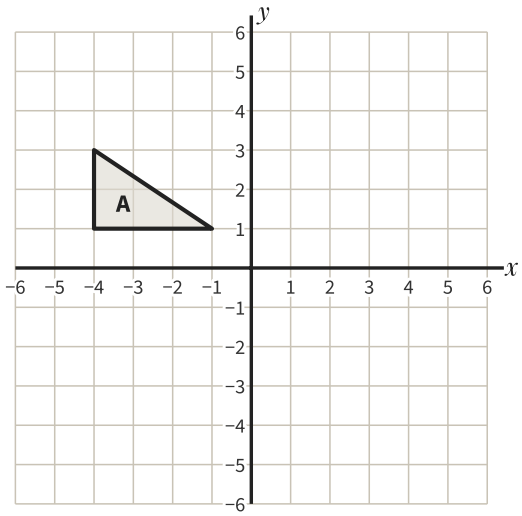
Combined transformations

5



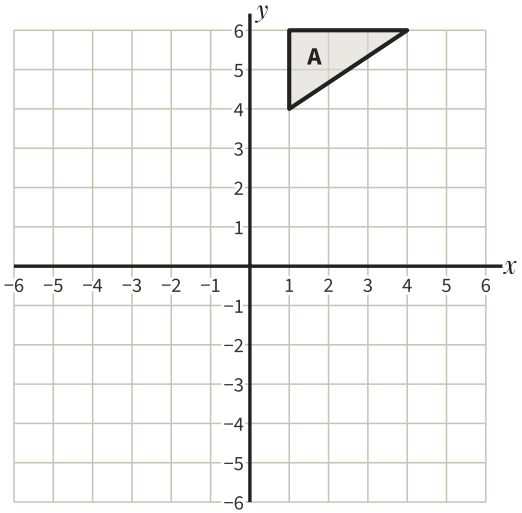
1. Rotate A **90° anticlockwise** about (0, 0). Label it B.
2. Reflect B in the y axis. Label it C.
3. Describe fully the **single** transformation that maps A onto C.
4. Which points do not move under this single transformation?

6



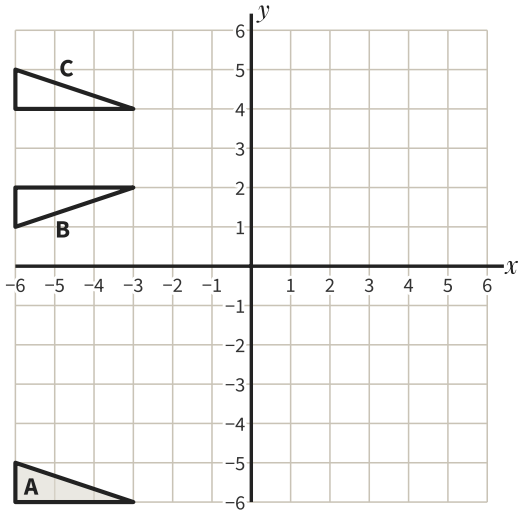
1. Reflect A in the line $y = -1$. Label it B.
2. Reflect B in the line $x = 1$. Label it C.
3. Describe fully the **single** transformation that maps A onto C.

7



1. Reflect A in the y axis. Label it B.
2. Reflect B in the line $y = x$. Label it C.
3. Describe fully the **single** transformation that maps A onto C.

8



A is reflected in the line $y = -2$ to give B, then B in the line $y = 3$ to give C. Asked for the single transformation that maps A onto C, Jo wrote "Reflection in $y = -2$, then reflection in $y = 3$".

1. Why does Jo get no marks?
2. Describe fully the **single** transformation that maps A onto C.

Combined transformations *further practice*

9

The point P (3, 4) is reflected in the y axis, then the image is reflected in the x axis.

(a) Where does P end up?

(b) Describe fully the single transformation that does the same.

10

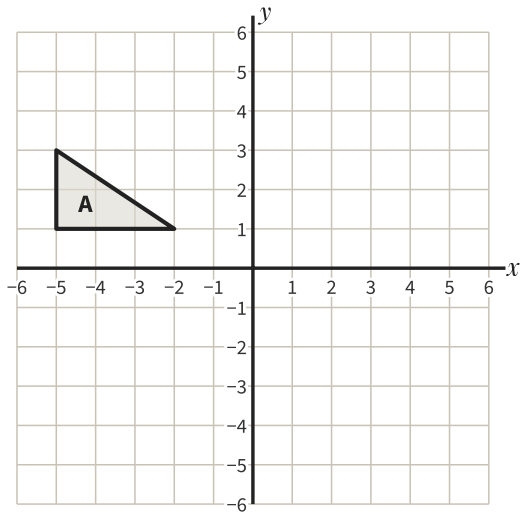
Write down the invariant points of each transformation.

(a) Reflection in the line $y = -1$

(b) Rotation 90° clockwise about (2, −3)

(c) Translation by the vector $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$

11

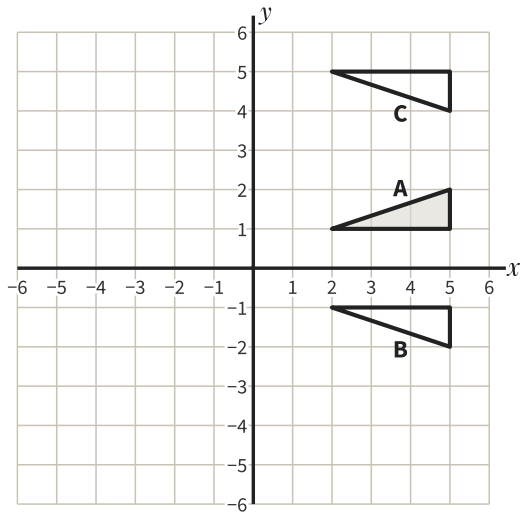


1 Reflect A in the x axis, then in the line $y = x$. Label it C.

2 From A again: the line $y = x$ first, then the x axis. Label it D.

3 Are C and D the same? Describe fully the single transformation that maps A onto each.

12



A is reflected in the x axis to give B. Then B is transformed to give C.

1 Describe fully the transformation that maps B onto C.

2 Describe fully the **single** transformation that maps A onto C.

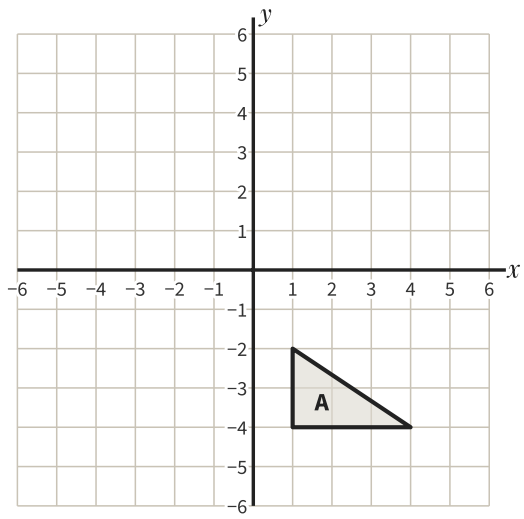
Combined transformations *further practice*

13

On a phone screen, Amara slides a sticker by the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$, then by the vector $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$.

Describe fully the single transformation that moves the sticker straight to the same place.

14



1. Reflect A in the line $x = -1$. Label it B.
2. Reflect B in the line $y = 1$. Label it C.
3. Mo says one reflection maps A onto C. Explain why Mo is wrong.
4. Describe fully the **single** transformation that maps A onto C.

15

The point P (3, 2) is on the line $x = 3$. A shape is reflected in the line $x = 3$, then translated by the vector $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$.

Is P an invariant point of the two steps together? Explain.

16

A shape is reflected in the line $x = 2$, then in the line $x = 5$.

Describe fully the single transformation. (Hint: follow the point (0, 0).)