

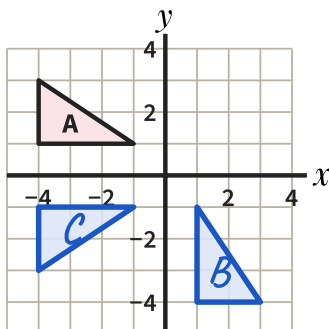
Combined Transformations *stretch*

ANSWERS

1



Reflect A in $y = x$ to give B, then rotate B 90° clockwise about $(0, 0)$ to give C. Describe fully the single transformation from A to C.

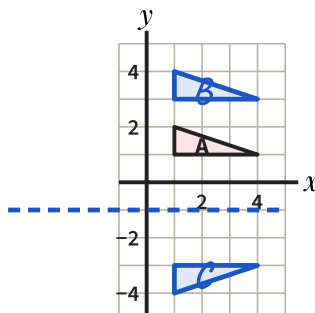


Answer Reflection in the x axis

2



Translate A by $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$ to give B. Reflect B in the x axis to give C. Describe fully the single transformation from A to C.



Answer Reflection in $y = -1$

3



A shape is reflected in the line $x = -1$, then in the line $x = 3$. Follow the point $(0, 2)$ through both reflections, then describe fully the single transformation.

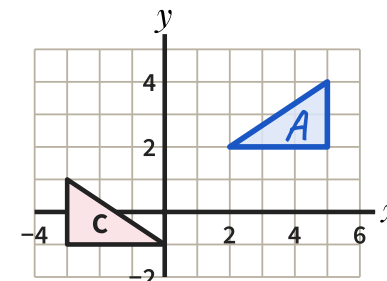
$$(0, 2) \rightarrow (-2, 2) \rightarrow (8, 2)$$

Answer Translation by $\begin{pmatrix} 8 \\ 0 \end{pmatrix}$

4



Shape A was reflected in the y axis, then translated by $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$ to give shape C. Draw shape A.



Answer $(2, 2), (5, 2), (5, 4)$

5



Ana says it does not matter which you do first: an enlargement, scale factor 2, centre $(0, 0)$, or a translation by $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$. Use the point $(2, 1)$ to show that Ana is wrong.

$$\text{enlarge first: } (2, 1) \rightarrow (4, 2) \rightarrow (5, 2)$$

$$\text{translate first: } (2, 1) \rightarrow (3, 1) \rightarrow (6, 2)$$

Reason $(5, 2)$ and $(6, 2)$ are different

6



A logo app flips a design in the line $x = 2$ and then in the line $y = 1$. Where does the point $(5, 3)$ end up? Describe fully the single transformation.

$$(5, 3) \rightarrow (-1, 3) \rightarrow (-1, -1)$$

the mirrors cross at $(2, 1)$

Answer Rotation 180° about $(2, 1)$

7



Zak reflects a shape in the line $y = x$ and then in the line $y = -x$. He says the single transformation is a reflection in the y axis. Explain why Zak is wrong and give the correct single transformation.

two reflections keep it the right way round

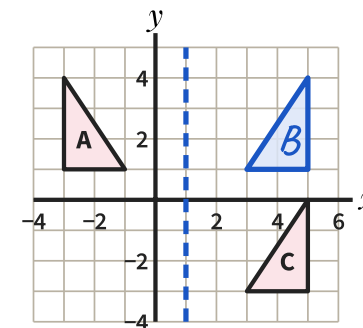
$$(1, 2) \rightarrow (2, 1) \rightarrow (-1, -2)$$

Reason Rotation 180° about $(0, 0)$

8



Shape A is reflected in a mirror line to give B. Then B is translated by $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$ to give C. Find the equation of the mirror line.



Answer $x = 1$