## Transformations


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## 1


(a) On the grid, draw the image of
(i) triangle $T$ after a reflection in the line $x=-1$,
(ii) triangle $T$ after a rotation through $180^{\circ}$ about $(0,0)$.
(b) Describe fully the single transformation that maps
(i) triangle $T$ onto triangle $U$,

Answer(b)(i) $\qquad$
$\qquad$
(ii) triangle $T$ onto triangle $V$.

Answer(b)(ii) $\qquad$
$\qquad$

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(a) Draw the image when triangle $A$ is reflected in the line $x=1$.
(b) Draw the image when triangle $A$ is translated by the vector $\binom{-2}{3}$.
(c) Draw the image when triangle $A$ is enlarged by scale factor 2 with centre (4, 5).
(d) Describe fully the single transformation that maps triangle $A$ onto triangle $B$.
$\qquad$
$\qquad$

2 (a)

(i) Draw the image of triangle $T$ after a translation by the vector $\binom{5}{-2}$.
(ii) Draw the image of triangle $T$ after a reflection in the line $y=1$.
(iii) Describe fully the single transformation that maps triangle $T$ onto triangle $Q$.
$\qquad$
$\qquad$

## 2



Describe fully the single transformation which maps
(a) $A$ onto $B$,

> Answer(a)
(b) $C$ onto $D$,
Answer(b)
(c) $A$ onto $C$,
Answer(c)
(d) $C$ onto $E$.

(a) Two different single transformations can map shape $A$ onto shape $B$.

Describe each transformation fully.

Answer(a)
or
$\qquad$
(b) Reflect shape $A$ in the $x$ axis. Draw the image and label it $C$.
(c) Rotate shape $B$ through $90^{\circ}$ clockwise about the origin. Draw the image and label it $D$.
(d) Describe fully the single transformation which maps shape $C$ onto shape $B$.

## Answer(d)

(e) Draw the enlargement of shape $A$, centre $(-4,8)$, with scale factor $\frac{1}{2}$.

Label the image $E$.

8

(a) On the grid,
(i) translate X by the vector $\binom{-7}{2}$,
(ii) rotate Y through $90^{\circ}$ anticlockwise about the origin.
(b) (i) On the grid, reflect Z in the $x$-axis. This is the image $\mathrm{Z}_{1}$
(ii) On the grid, reflect the image $Z_{1}$ in the line $x=4$. This is the image $Z_{2}$.
(iii) Describe a single transformation which maps the image $Z_{2}$ onto the original $Z$.

Answer(b)(iii)

Question 9 is printed on the next page.

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(a) On the grid, draw the image of
(i) the flag $A B C D$ after translation by $\binom{4}{-3}$,
(ii) the flag $A B C D$ after enlargement, scale factor 2, centre the origin,
(iii) the flag $A B C D$ after reflection in the $x$-axis.
(b) Describe fully the single transformation which maps $A B C D$ onto $P Q R S$.
$\qquad$
(c) Describe fully the single transformation which maps $A B C D$ onto TUVW.
$\qquad$


Shapes $A, B$ and $C$ are shown on the grid.
(a) Describe fully the single transformation which maps
(i) shape $A$ onto shape $B$,
Answer(a)(i)
(ii) shape $A$ onto shape $C$.
Answer(a)(ii)
(b) On the grid draw the image of shape $\boldsymbol{A}$ after
(i) a translation by the vector $\binom{6}{4}$,
(ii) an enlargement, scale factor 2 , centre the origin.

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Shapes $P, Q$, and $R$ are shown on the grid.
(a) On the grid, draw the image of shape $\boldsymbol{P}$ after
(i) a rotation through $180^{\circ}$ about the origin,
(ii) a reflection in the line $y=3$,
(iii) a translation by the vector $\binom{-5}{3}$.
(b) Describe fully the single transformation which maps
(i) shape $P$ onto shape $Q$,

Answer(b)(i)
(ii) shape $P$ onto shape $R$.

Answer(b)(ii)

3

(a) Describe fully the single transformation that maps
(i) flag $F$ onto flag $G$,

Answer(a)(i)
(ii) flag $F$ onto flag $H$,

Answer(a)(ii)
(iii) flag $F$ onto flag $I$.

Answer(a)(iii)
(b) On the grid, draw
(i) the reflection of flag $F$ in the $y$-axis,
(ii) the enlargement of flag $F$, centre $(0,0)$ and scale factor 4 .

