

Transformations 2 IGCSE Answers

1)

(a) (i) Correct translation to (3, -5), (5, -6) and (4, -4)	2	SC1 for translation of $\begin{pmatrix} 3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -7 \end{pmatrix}$ or vertices only
(ii) Correct reflection to (4, 1), (5, 3) and (6, 2)	2	SC1 for reflection in $y = 3$ or vertices only
(iii) Correct rotation to (-2, 0), (-1, 2) and (-3, 1)	2	SC1 for rotation 90 clockwise around (0, 0) or vertices only
(iv) Correct enlargement to (0, -3), (-8, 1) and (-4, -7)	2	SC1 for two correct points or vertices only
(b) 16 cao	1	

2)

(a) (i) Reflection only $y = -2$	B1	Spoilt if extras
(ii) Enlargement only $\frac{1}{2}$ (1, 4)	B1	Spoilt if extras
(iii) Rotation only 90° clockwise oe Around (1, -3)	B1	Spoilt if extras
(b) (i) Triangle at (-4, 4), (-1, 4), (-1, 5)	2	B1 for translation of $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 2 \end{pmatrix}$ After B0 , SC1 for translation of 5 small squares to the left and 2 small squares up
(ii) Triangle at (4, 4), (1, 4), (4, 6)	3	B1 for each of (4, 4) or (4, 6) plotted If no/wrong plots allow SC2 for 3 correct coordinates shown in working or SC1 for any 2 correct coordinates shown or M1 for $\begin{pmatrix} 1 & 0 \\ 0 & 2 \end{pmatrix} \begin{pmatrix} 1 & 4 & 4 \\ 2 & 2 & 3 \end{pmatrix}$ shown

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3)	<p>(a) Reflection only $x = -1$ oe only</p> <p>(b) (i) Triangle $(-1, 2) (-1, 6) (-3, 6)$</p> <p>(ii) Triangle $(-1, -2) (-1, -6) (-3, -6)$</p> <p>(iii) Triangle $(1, -1) (7, -1) (7, 2)$</p> <p>(c) (i) Triangle drawn at $(2, 3) (6, 7) (6, 9)$</p> <p>(ii) Shear (only) y axis invariant (factor) 1</p> <p>(d) $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$</p>	<p>B1</p> <p>B1</p> <p>B2</p> <p>B2</p> <p>B2</p> <p>3</p> <p>B1</p> <p>B1</p> <p>B1</p> <p>B2</p>	<p>Two transformations scores 0</p> <p>B1 for vertices plotted only or for clockwise rotation about $(0,0)$</p> <p>B1 for vertices plotted only or for reflection in $x = y$</p> <p>B1 for vertices plotted only or for enlargement by 1.5 with correct orientation</p> <p>B2 for 2 correct vertices plotted or SC2 for 3 correct coordinates shown in working or SC1 for any 2 correct coordinates</p> <p>or M1 for $\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} 2 & 6 & 6 \\ 1 & 1 & 3 \end{pmatrix}$</p> <p>Two transformations scores 0</p> <p>or $x = 0$ invariant</p> <p>B1</p> <p>B1 for either column or row correct</p>
4)	<p>(a) Image $(1, -1), (1, -2), (4, -2), (3, -1)$</p> <p>(b) Image $(-3, 2), (-4, 2), (-4, 5), (-3, 4)$</p> <p>(c) (i) Rotation only, 90 clockwise oe, (Centre) $(0, 0)$ oe</p> <p>(ii) $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$</p>	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p>	<p>B1 if vertices plotted only or reflects in $y = -x$</p> <p>B1 for translation by $\begin{pmatrix} -2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 1 \end{pmatrix}$</p> <p>Spoilt if extras</p> <p>B1 for one row or one column correct</p>
5)	<p>(a) triangle at $(1, 1), (1, -1), (2, -1)$</p> <p>(b) triangle at $(-1, -1)(1, -1), (1, -2)$</p> <p>(c) reflection in the x axis</p>	<p>2</p> <p>2ft</p> <p>2</p>	<p>SC1 triangle at $(-1, -1), (-1, 1), (-2, 1)$</p> <p>correct or reflection of their triangle in $y = -x$</p> <p>B1 reflection B1 x axis or $y = 0$</p>