

Question	Answer	Marks	AO Element	Notes	Guidance
1	correct reflection	2		<b>B1</b> for 5 vertices correct	
2	Correct ruled enlargement	2		<b>B1</b> for two sides correct or for enlargement incorrect scale factor	
3	Correct enlargement drawn	2		<b>B1</b> for correct sf but wrong position	
4(a)	Triangle at (-1, 1) (-4, 2) (-3, 5)	1			
4(b)	Triangle at (-2, -3) (1, -2) (0, 1)	2		<b>B1</b> for translation by $\begin{pmatrix} -3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -4 \end{pmatrix}$	
5	Rotation clockwise 90° [centre] (0, 0)	3		<b>B1</b> for each	
6(a)	Triangle at (-4, -4) (-1, -3) (-4, -3)	2		<b>B1</b> for correct points not joined or for reflection in any $y = k$ or for reflection in $x = -1$	

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6(b)	Triangle at (1, 1) (1, 4) (2, 4)	2		<b>B1</b> for correct points not joined or rotation 90° clockwise around any point or rotation 90° anticlockwise around (0, 0)	
6(c)	Translation $\begin{pmatrix} 5 \\ -6 \end{pmatrix}$	2		<b>B1</b> for translation or correct vector oe	
7(a)(i)	triangle with vertices at (-2, -1) (-8, -1) (-2, -5)	2		<b>B1</b> for correct reflection in $y = x$	
7(a)(ii)	triangle with vertices at (-1, -1) (-1, -7) (3, -7)	2		<b>B1</b> for translation by $\begin{pmatrix} k \\ -9 \end{pmatrix}$ or $\begin{pmatrix} -2 \\ k \end{pmatrix}$	
7(b)(i)	Enlargement [centre] (-7, 8) [sf] $\frac{1}{2}$	3		<b>B1</b> for each	
7(b)(ii)	Rotation [centre] (0, 0) 90° clockwise oe	3		<b>B1</b> for each	

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8(a)(i)	Rotation [centre] (0, 0) oe 90° [anticlockwise] oe	3		<b>B1</b> for each	
8(a)(ii)	Translation $\begin{pmatrix} -6 \\ -3 \end{pmatrix}$	2		<b>B1</b> for each	
8(a)(iii)	Enlargement [centre] (6, 4) [sf] 3	3		<b>B1</b> for each	
8(b)	Correct reflection (2, -3), (2, -4), (5, -3)	2		<b>B1</b> for correct reflection in $y = k$	
9	Image at (1, 2), (1, 5), (3, 5), (3, 4)	2		<b>B1</b> for $y = x$ drawn or for 3 correct points	
10	correctly enlarged triangle	2		<b>M1</b> for an enlargement scale factor 3 but incorrect position	
11(a)	Translation $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$	2		<b>B1</b> for each	

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11(b)	Correct reflection vertices (3, -3), (1, -3), (3, -4)	2		<b>B1</b> for reflection in line $x = -1$ or $y = k$	
11(c)	Correct rotation vertices (-3, -1), (-1, -1), (-3, -2)	2		<b>B1</b> for correct orientation but wrong position	
12	Enlargement [sf] $-\frac{1}{2}$ [centre] (4, 4)	3		<b>B1</b> for each	
13(a)	Translation $\begin{pmatrix} -1 \\ -8 \end{pmatrix}$	2		<b>B1</b> for each	
13(b)	Image at (-1, -1), (-4, -1), (-1, -2)	2		<b>B1</b> for image correct scale factor and orientation but wrong position or for enlargement scale factor $\frac{1}{2}$ centre (0, 0)	
14(a)(i)	rotation 90 anticlockwise oe (-3, 2)	3		<b>B1</b> for each	

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14(a)(ii)	enlargement $-\frac{1}{2}$ (-2, -1)	3		<b>B1</b> for each	
14(b)	Image at (-3, -5) (1, -5) (1, 3)	2		<b>B1</b> for translation by $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -10 \end{pmatrix}$	
14(c)	Image at (2, 3) (6, 3) (6, -5)	2		<b>B1</b> for reflection in $y = k$ or $x = 4$	
15(a)(i)	Translation $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$	2		<b>B1</b> for each Accept 5 right and 8 up	
15(a)(ii)	Enlargement [sf] 0.5 oe [centre] (0, -7)	3		<b>B1</b> for each	
15(a)(iii)	Rotation 90 [anticlockwise] oe Origin oe	3		<b>B1</b> for each	

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15(b)	Image at $(-8, 1)$ $(-8, 5)$ $(-8, 7)$ $(-4, 1)$	2		<b>B1</b> for reflection of flag A in the line $x = -1$ or $y = k$ or for vertices of triangle in correct place but not joined	
16	Enlargement [scale factor] $-\frac{1}{2}$ [centre] $(3, 4)$	3		<b>B1</b> for each	
17(a)	Rotation $90^\circ$ clockwise oe $(1, 0)$	3		<b>B1</b> for each	
17(b)	Enlargement $-2$ $(0, 2)$	3		<b>B1</b> for each	
18(a)	Image at $(1, 7)$ , $(4, 7)$ , $(4, 9)$ , $(3, 9)$	2		<b>B1</b> for translation by $\begin{pmatrix} -1 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 6 \end{pmatrix}$	
18(b)	Image at $(5, 3)$ , $(6, 3)$ , $(8, 5)$ , $(5, 5)$	2		<b>B1</b> for $180^\circ$ rotation with wrong centre	

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18(c)	Rotation 180° (4.5, 6)  OR  Enlargement [factor] -1 (4.5, 6)	3		<b>B1</b> for rotation <b>B1</b> for 180° <b>B1FT</b> for centre from <i>their</i> (a)  <b>B1</b> for enlargement <b>B1</b> for -1 <b>B1FT</b> for centre from <i>their</i> (a)	
19(a)(i)	Image at (-5, 4), (-2, 4), (-4, 6)	2		<b>B1</b> for translation by $\begin{pmatrix} -3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 2 \end{pmatrix}$	
19(a)(ii)	Image at (2, 1), (4, -1), (2, -2)	2		<b>B1</b> for reflection in $y = -x$ or $y = x$ drawn	
19(b)	Rotation 90° [anticlockwise] oe (1, -1)	3		<b>B1</b> for each	
20(a)(i)	Reflection $x = 1.5$	2		<b>B1</b> for each	
20(a)(ii)	Rotation (0, -1) 90° [anticlockwise] oe	3		<b>B1</b> for each	

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20(b)(i)	Image at (5, -1) (6, -1) (6, -3)	2		<b>B1</b> for correct size and orientation but wrong position  If 0 scored, <b>SC1</b> for enlargement SF $\frac{1}{2}$ with centre (3, 0)	
20(b)(ii)	Image at (-6, 3) (-4, 3) (-6, 7)	2		<b>B1</b> for translation $\begin{pmatrix} -3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 1 \end{pmatrix}$	
21(a)	Reflection $y = -1$	2		<b>B1</b> for each	
21(b)	Triangle at (0, -3), (4, -1), (4, -3)	2		<b>B1</b> for translation $\begin{pmatrix} -2 \\ k \end{pmatrix}$  or $\begin{pmatrix} k \\ -5 \end{pmatrix}$ or for three correct vertices	
21(c)	Triangle at (-2, 2), (-2, 6), (-4, 6)	2		<b>B1</b> for rotation about (0, 0) 90° clockwise or 90° anticlockwise with wrong centre or for three correct vertices	



Question	Answer	Marks	AO Element	Notes	Guidance
21(d)	Triangle at (-3, -1), (-3, -2), (-1, -1)	2		<b>B1</b> for scale factor $-\frac{1}{2}$ with wrong centre or scale factor $\frac{1}{2}$ with centre (0, 0) or for three correct vertices	
22(a)	Enlargement [scale factor] 2 [centre] (7, 0)	3		<b>B1</b> for each	
22(b)	Image at (6, 4), (7, 4), (6, 8)	3		<b>B2</b> for rotation through 90° clockwise but about other point  or <b>B1</b> for rotation through 90° anticlockwise about any point or for triangle at (6, 4), (7, 4), (6, k)	
23(a)(i)	Image at (3, -3), (7, -3), (7, -5)	2		<b>B1</b> for reflection in any $x = k$ or if 3 correct points not joined	

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23(a)(ii)	Image at (-5, 1), (-1, 1), (-5, -1)	2		<b>B1</b> for translation by $\begin{pmatrix} -2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 4 \end{pmatrix}$ or if 3 correct points not joined	
23(a)(iii)	Image at (6, 3), (6, 4), (4, 3)	3		<b>B2</b> for correct size and orientation but wrong position or if 3 correct points not joined <b>B1</b> for enlargement SF $\frac{1}{2}$ with centre (3, 1)	
23(b)	Rotation 90° [anticlockwise] oe (-6, -2)	3		<b>B1</b> for each	
24(a)	Rotation [centre] origin oe 90°[anti-clockwise] oe	3		<b>B1</b> for each	
24(b)	Enlargement [centre] (0, 3) [sf] - 2	3		<b>B1</b> for each	
25	Enlargement	1			

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	$\frac{1}{2}$	1			
	origin oe	1			
					[Total: 140]

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