

Transformations

Foundation and Higher tiers | Total marks: 36

Marks

- M** Method mark, for a correct method. It can be implied by a correct answer.
- A** Accuracy mark, for a correct answer. It needs the method mark before it.
- B** A mark for a correct value or statement, with or without working.
- ft** Follow through: the mark is given for using an earlier wrong answer correctly.
- oe** Or equivalent.
- [a, b]** Any value from a to b inclusive.

Questions

Q	Skill	Spec	Tier	Grade	Calculator	Marks
1	Reflection in a mirror line	G7	Foundation	2	No	2
2	Recognising a transformation	G7	Foundation	2	No	1
3	Translation by a vector	G7 G24	Foundation	3	No	2
4	Column vectors for translations	G24	Foundation	3	No	2
5	Rotation about a point	G7	Foundation	4	No	2
6	Enlargement, positive scale factor	G7	Foundation	4	No	2
7	Reflection, spot the error	G7	Foundation	4	No	2
8	Describing a rotation	G7	Foundation	5	No	3
9	Reflection in $y = x$	G7	Foundation	5	No	2
10	Enlargement, fractional scale factor	G7	Common	5	No	2
11	Combined transformations	G8 G7	Higher	7	No	4
12	Combined transformations and invariance	G8	Higher	7	No	3
13	Enlargement, negative scale factor	G7	Higher	7	No	3
14	Lengths in an enlargement	G7	Foundation	2	Yes	3
15	Scale factor of an enlargement	G7	Foundation	4	Yes	3
	Total					36

Question 1 G7 · Foundation · Grade 2 · 2 marks

Q	Answer	Mark	Comments
1	correct reflection	B2	B1 for a reflection in any vertical line, or for 4 vertices correct

Question 2 G7 · Foundation · Grade 2 · 1 mark

Q	Answer	Mark	Comments
2	translation	B1	

Question 3 G7 G24 · Foundation · Grade 3 · 2 marks

Q	Answer	Mark	Comments
3	vertices at $(-4, -1)$, $(-1, -1)$, $(-4, 1)$	B2	B1 for a translation of $\begin{pmatrix} -5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 2 \end{pmatrix}$

Question 4 G24 · Foundation · Grade 3 · 2 marks

Q	Answer	Mark	Comments
4(a)	$\begin{pmatrix} -3 \\ 2 \end{pmatrix}$	B1	
4(b)	$(-2, 10)$	B1	

Question 5 G7 · Foundation · Grade 4 · 2 marks

Q	Answer	Mark	Comments
5	vertices at $(3, -2)$, $(3, -4)$, $(4, -4)$, $(4, -3)$, $(6, -3)$, $(6, -2)$	B2	B1 for a 90° clockwise rotation about another point, or a 90° anticlockwise rotation about $(1, -1)$

Question 6 G7 · Foundation · Grade 4 · 2 marks

Q	Answer	Mark	Comments
6	correct enlargement: the right angle 3 squares right and 3 squares up from C, sides 6 squares and 3 squares	B2	B1 for a triangle with sides 6 and 3 squares in the correct orientation, or two vertices correct

Question 7 G7 · Foundation · Grade 4 · 2 marks

Q	Answer	Mark	Comments
7(a)	C with vertices at $(-4, 0)$, $(-1, 0)$, $(-1, -1)$, $(-3, -1)$, $(-3, -3)$, $(-4, -3)$	B1	
7(b)	B is not in the same place as C	B1	oe, B faces the other way, or B is a rotation (of 180°)

Question 8 G7 · Foundation · Grade 5 · 3 marks

Q	Answer	Mark	Comments
8	rotation	B1	
	90° anticlockwise	B1	accept 270° clockwise
	centre (-1, 2)	B1	

Question 9 G7 · Foundation · Grade 5 · 2 marks

Q	Answer	Mark	Comments
9	vertices at (-2, 1), (-2, 4), (-4, 4)	B2	B1 for a reflection in $y = -x$, or two vertices correct

Question 10 G7 · Common · Grade 5 · 2 marks

Q	Answer	Mark	Comments
10	vertices at (-2, -1), (0, -1), (0, 1), (-1, 1)	B2	B1 for the correct size and shape in the wrong place, or three vertices correct

Question 11 G8 G7 · Higher · Grade 7 · 4 marks

Q	Answer	Mark	Comments
11(a)	B at (1, -2), (4, -2), (1, -4)	B1	
	C at (-2, -1), (-2, -4), (-4, -1)	B1ft	ft their B
11(b)	reflection	B1	
	in the line $y = -x$	B1	

Question 12 G8 · Higher · Grade 7 · 3 marks

Q	Answer	Mark	Comments
12(a)	follows a point or a shape through both transformations	M1	for example $(2, 5) \rightarrow (-2, -5) \rightarrow (-2, 5)$
	Yes with a correct general argument or a correct shape drawn	A1	a single point is not enough for A1
12(b)	any point on the y-axis	B1	such as (0, 3) or (0, 0)

Question 13 G7 · Higher · Grade 7 · 3 marks

Q	Answer	Mark	Comments
13	enlargement	B1	
	scale factor -2	B1	
	centre (0, 1)	B1	

Question 14 G7 · Foundation · Grade 2 · 3 marks

Q	Answer	Mark	Comments
14(a)	13.05	B1	
14(b)	$2 \times (13.05 + 8.4)$ or $3 \times 2 \times (4.35 + 2.8)$	M1	oe, ft their length from (a)
	42.9	A1	

Question 15 G7 · Foundation · Grade 4 · 3 marks

Q	Answer	Mark	Comments
15	$13.2 \div 4.8$ or 2.75	M1	oe, the scale factor
	$6.2 \times$ their 2.75	M1	oe, or $13.2 \times \frac{6.2}{4.8}$
	17.05	A1	