

GCSE Mathematics (1MA1)

Themed papers – Transformations

Compiled from student-friendly mark schemes

Please note that this mark scheme is not the one used by examiners for making scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.

It should also be noted that for many questions, there may be alternative methods of finding correct solutions that are not shown here – they will be covered in the formal mark scheme.

NOTES ON MARKING PRINCIPLES

Guidance on the use of codes within this mark scheme

M1 – method mark. This mark is generally given for an appropriate method in the context of the question. This mark is given for showing your working and may be awarded even if working is incorrect.

P1 – process mark. This mark is generally given for setting up an appropriate process to find a solution in the context of the question.

A1 – accuracy mark. This mark is generally given for a correct answer following correct working.

B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.

C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.

Some questions require all working to be shown; in such questions, no marks will be given for an answer with no working (even if it is a correct answer).

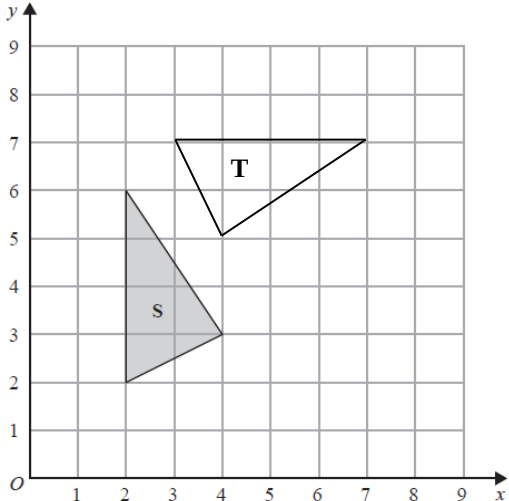
Question 1 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Rotation, 90° anti-clockwise (or 270° clockwise, centre $(0, -1)$)	M1	This mark is given for seeing one of these terms used.
	Rotation 90° anti-clockwise with centre $(0, -1)$	A1	This mark is given for the correct answer only

Question 2 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Rotation of 90° anticlockwise about $(-2, 1)$	B2	These marks are given for a full description of the transformation (B1 is given for two of the elements of the description)

Question 3 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		M1	This mark is given for the shape T drawn in the correct orientation
		A1	This mark is given for the shape T drawn in the correct orientation with coordinates $(4, 5)$, $(3, 7)$ and $(7, 7)$
(b)	Rotation of 90° anticlockwise with centre $(5, 4)$	B1	This mark is given for a correct description of the transformation

Question 4 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	The diagram shows a coordinate grid with x and y axes. The x-axis is labeled from 0 to 8, and the y-axis is labeled from 0 to 11. A small quadrilateral is drawn with vertices at (1, 2), (2, 3), (2, 4), and (1, 4). A larger shaded quadrilateral labeled 'A' is drawn with vertices at (3, 4), (6, 7), (6, 10), and (3, 10).	B2	These marks are given for a correct enlargement at the points (1, 2) (2, 3) (2, 4) and (1, 4) (B1 is given for a shape with the correct size and orientation but in the wrong position)

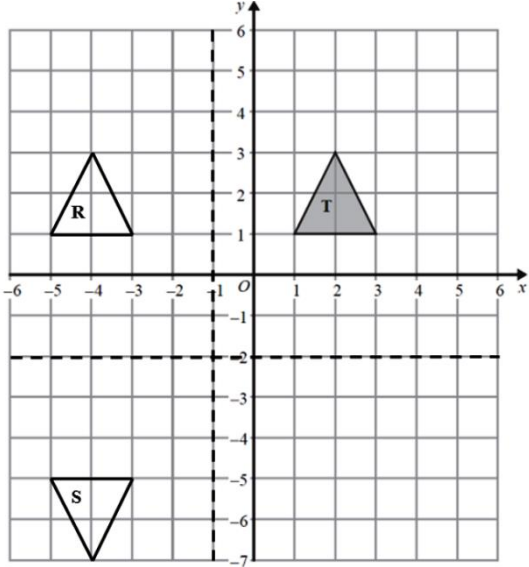
Question 5 (Total 1 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	For example: The scale factor in the diagram is 2.5 $5 \div 2$ is not $1 \frac{1}{2}$	C1	This mark is given for the correct statement to say why Roy's diagram is not correct

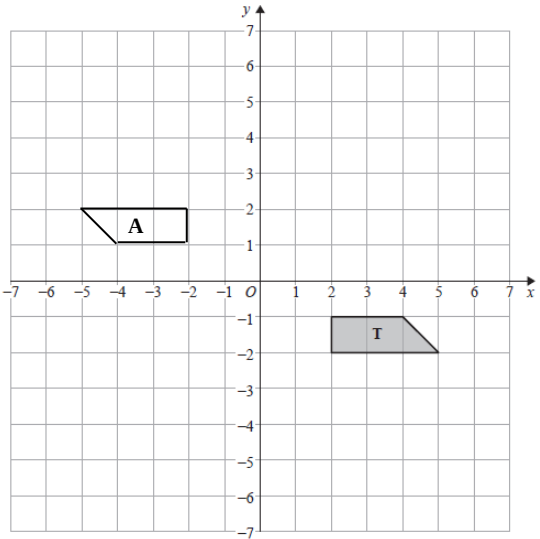
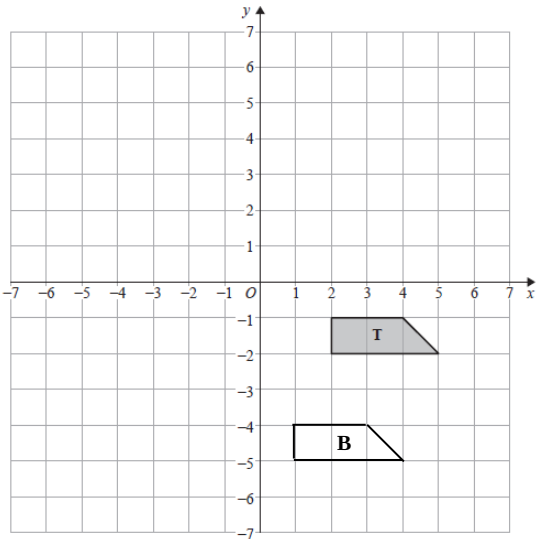
Question 6 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for a correct reflection of A shown on the diagram
		A1	This mark is given for a correct value for either c or d
		A1	This mark is given for a correct value for both c and d

Question 7 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B1	Rotation or Enlargement with scale factor -1
	Rotation of 180° about $(-1, -2)$ or Enlargement with scale factor -1 , with centre $(-1, -2)$	B1	About $(-1, -2)$ or With centre $(-1, -2)$

Question 8 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
		1	This mark is given for a shape labelled A with coordinates $(-2, 1)$, $(-4, 1)$, $(-2, 2)$ and $(-5, 2)$
		1	This mark is given for a shape labelled B with coordinates $(1, -4)$, $(3, -4)$, $(1, -5)$ and $(4, -5)$

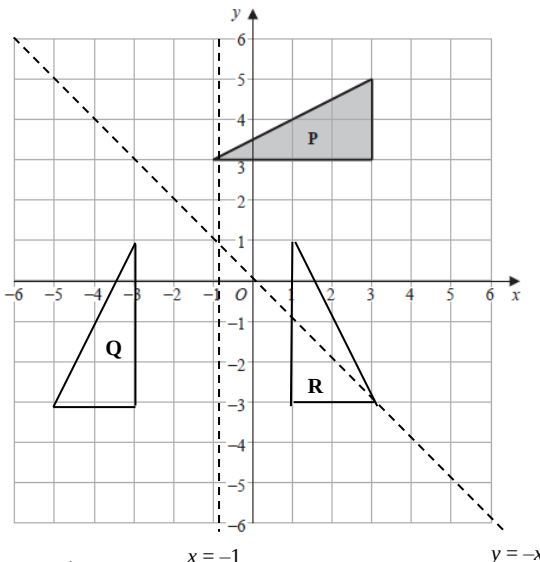
Question 9 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M2	These marks are given for the correct position of triangle C or triangle E (One mark is given for the correct position of triangle B or triangle D)
	Amy is not correct	C1	This mark is given for a correct conclusion with supporting evidence

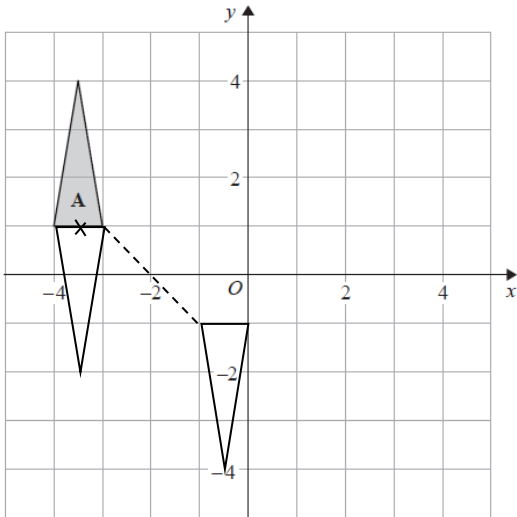
Question 10 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		B2	These marks are given for a triangle with vertices at (2.5, 1), (2.5, 6) and (5, 6) (B1 is given for a triangle of the right size and orientation but in the wrong place or a correct enlargement of a different scale factor with centre (0, 1))

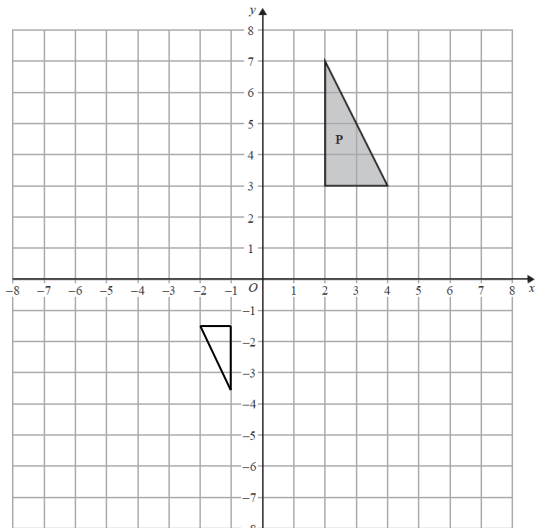
Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	 Rotation	M1	This mark is given for stating rotation or showing R twice reflected on the grid with coordinates (1, 1), (1, -3) and (3, -3)
	90° clockwise	A1	This mark is given for the correct angle and direction of the rotation
	centre (-1, 1)	A1	This mark is given for the correct centre of rotation

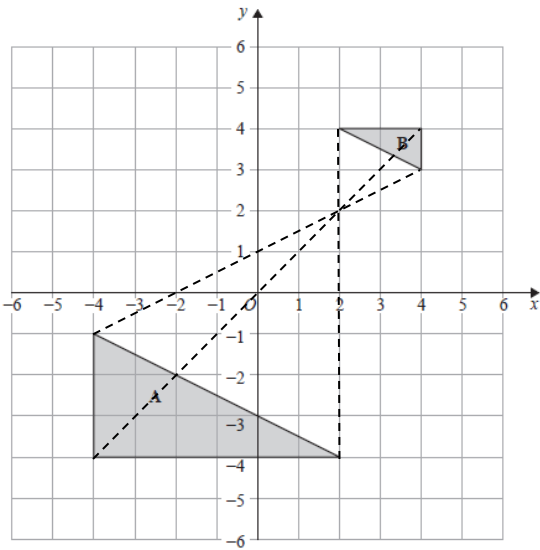
Question 12 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for showing a rotation of 180° about $(-2, 0)$ followed by a translation $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$
	$(-3.5, 1)$	A1	This mark is given for the correct answer only

Question 13 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		2	These two marks are given for a correct enlargement (position, size and orientation) with coordinate points $(-1, -1.5)$, $(-1, -3.5)$ and $(-2, -1.5)$ [1 mark is given for an enlargement with correct size and orientation in the incorrect position]

Question 14 (Total 2 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	 Enlargement of scale factor $-\frac{1}{3}$ with centre (2, 2)	C1 C1	This mark is given for all two parts of the transformation described This mark is given for all three parts of the transformation described

Question 15 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Enlargement, scale factor -2 , centre (4, 6)	B2	These two marks are given for a full description of the transformation (B1 is given for two correct aspects)

Question 16 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Rotation 180° or Rotation 90° clockwise or Rotation 90° anticlockwise	C1	This mark is given for finding an angle of the rotation
	about $(-1, 2)$ or $(-1, 4)$ or about $(-1, 0)$ or about $(-1, 6)$	C1	This mark is given for finding the corresponding centre of rotation

Question 17 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	1	B1	This mark is given for a correct answer only
(b)	Translation	C1	This mark is given for the correct answer only
	$\begin{pmatrix} 0 \\ 2 - 2k \end{pmatrix}$	C1	This mark is given for the correct answer only, including correct notation

Mark scheme for 1MA1 Higher themed papers: Transformations

Performance data:

Q	Taken from			Total Marks available	TOPIC	Spec Ref	AO	% Mean marks	Edexcel mean averages Marks of candidates who achieved grade:										
	Q	Series	Paper						ALL	9	8	7	6	5	4	3	2	1	U
1	2	Mock Set 1	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	4	Mock Set 4	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3a	2a	Mock Set 3	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3b	2b	Mock Set 3	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	7	June 2018	2H	2	Geometry	G7	1	69	1.37	1.96	1.86	1.72	1.50	1.18	0.73	0.31	-	-	0.12
5	8b	June 2019	3H	1	Geometry	G7	3	66	0.66	0.89	0.81	0.74	0.66	0.58	0.47	0.36	-	-	0.27
6	5	June 2019	1H	3	Geometry	G7	2	66	1.99	2.78	2.61	2.37	2.07	1.65	1.15	0.60	-	-	0.29
7	7	June 2018	1H	2	Geometry	G7	2	60	1.19	1.88	1.72	1.52	1.27	0.96	0.59	0.28	-	-	0.13
8a	5a	Nov 2017	2H	1	Geometry	G7	1	53	0.53	1	0.88	0.71	0.71	0.68	0.59	0.48	-	-	0.26
8b	5b	Nov 2017	2H	1	Geometry	G7 G24	1	37	0.37	0.88	0.79	0.61	0.61	0.5	0.41	0.29	-	-	0.15
9	9	June 2017	2H	3	Geometry	G7, G8	2	52	1.57	2.55	2.23	1.91	1.59	1.27	0.88	0.53	-	-	0.33
10	9	Nov 2019	3H	2	Geometry	G7	1	45	0.90	1.89	1.62	1.45	1.36	1.19	0.75	0.45	-	-	0.20
11	8	Nov 2018	2H	3	Geometry	G7, G8	2	20	0.59	2.10	2.03	1.36	1.04	0.70	0.43	0.30	-	-	0.22
12	20	Nov 2018	3H	2	Geometry	G8	2	11	0.21	1.3	0.68	0.48	0.38	0.28	0.15	0.08	-	-	0.01
13	18	Nov 2017	1H	2	Geometry	G7	1	9	0.18	2.00	1.47	1.09	0.63	0.44	0.09	0.02	-	-	0.01
14	13	Nov 2018	1H	2	Geometry	G7	2	7	0.14	1	0.67	0.5	0.33	0.19	0.06	0.02	-	-	0.02
15	16	Mock Set 2	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	24	Nov 2019	2H	2	Geometry	G8	2	4	0.08	0.78	0.32	0.21	0.14	0.09	0.04	0	-	-	0.01
17a	21a	Mock Set 4	3H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17b	21b	Mock Set 4	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				38					9.78	21.01	17.69	14.67	12.29	9.71	6.34	3.72	-	-	2.02