
GCSE Mathematics

Transformations

Mark Scheme - Foundation | Grades 2-5

M = method mark, A = accuracy mark (dependent on the preceding M mark), B = independent mark.

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Edexcel-style questions

Q1 Grade 2 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	reflecting in the y-axis negates the x-coordinate of each point	M1
(a)	$(-1, 1)$, $(-3, 1)$, $(-1, 4)$	A1

Q2 Grade 3 Edexcel style

Total: 3

Part	Mark scheme	Marks
(a)	90° clockwise about the origin: $(x, y) \rightarrow (y, -x)$	M1
(a)	apply the rule to each vertex	M1
(a)	$(1, -1)$, $(1, -3)$, $(4, -1)$	A1

Q3 Grade 3 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	add 3 to each x-coordinate and 2 to each y-coordinate	M1
(a)	$(4, 3)$, $(6, 3)$, $(4, 5)$	A1

Q4 Grade 4 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	multiply each coordinate by 2	M1
(a)	$(2, 2)$, $(6, 2)$, $(2, 6)$	A1

Q5 Grade 5 Edexcel style

Total: 2

Part	Mark scheme	Marks
(a)	the shape flips over the x-axis, staying the same size	M1
(a)	reflection in the x-axis	A1

AQA-style questions

Q6 Grade 2 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	reflecting in the x-axis negates the y-coordinate of each point	M1
(a)	(2, -1), (5, -1), (2, -3)	A1

Q7 Grade 3 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	180° about the origin: $(x, y) \rightarrow (-x, -y)$	M1
(a)	apply the rule to each vertex	M1
(a)	(-2, -2), (-5, -2), (-2, -4)	A1

Q8 Grade 3 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	add -3 to each x-coordinate and 1 to each y-coordinate	M1
(a)	(-1, 4), (1, 4), (-1, 6)	A1

Q9 Grade 4 AQA style

Total: 2

Part	Mark scheme	Marks
(a)	multiply each coordinate by 3	M1
(a)	(3, 3), (6, 3), (3, 6)	A1

Q10 Grade 5 AQA style

Total: 3

Part	Mark scheme	Marks
(a)	reflect in the y-axis: triangle B = (-1, 1), (-3, 1), (-1, 3)	M1
(a)	translate by (0, -4): add 0 to x, subtract 4 from y	M1
(a)	triangle C = (-1, -3), (-3, -3), (-1, -1)	A1

OCR-style questions

Q11 Grade 3 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	each point's distance from $x = 3$ is reversed to the other side	M1
(a)	(5, 1), (2, 1), (5, 3)	A1

Q12 Grade 3 OCR style

Total: 3

Part	Mark scheme	Marks
(a)	90° anticlockwise about the origin: $(x, y) \rightarrow (-y, x)$	M1
(a)	apply the rule to each vertex	M1
(a)	(-1, 1), (-1, 3), (-3, 1)	A1

Q13 Grade 3 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	add 2 to each x-coordinate and -4 to each y-coordinate	M1
(a)	(3, -2), (5, -2), (3, 0)	A1

Q14 Grade 5 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	multiply each coordinate by $\frac{1}{2}$	M1
(a)	(0, 0), (2, 0), (0, 2)	A1

Q15 Grade 5 OCR style

Total: 2

Part	Mark scheme	Marks
(a)	divide each coordinate by the scale factor, 3	M1
(a)	(1, 2), (3, 2), (1, 4)	A1

Teachably-style questions

Q16 Grade 3 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	each point's distance from $y = 1$ is reversed to the other side	M1
(a)	(1, 0), (4, 0), (1, -2)	A1

Q17 Grade 4 Teachably style

Total: 4

Part	Mark scheme	Marks
(a)	translate so (2, 1) becomes the origin: (0, 0), (2, 0), (0, 2)	M1
(a)	rotate 90° clockwise: $(x, y) \rightarrow (y, -x)$: (0, 0), (0, -2), (2, 0)	M1
(a)	translate back by (2, 1)	M1
(a)	(2, 1), (2, -1), (4, 1)	A1

Q18 Grade 3 Teachably style

Total: 2

Part	Mark scheme	Marks
(a)	add -4 to each x-coordinate and -3 to each y-coordinate	M1
(a)	(-1, -2), (1, -2), (-1, 0)	A1

Q19 Grade 5 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	distance from (2, 2) to each vertex is multiplied by 2	M1
(a)	(2, 2) stays fixed; (6, 2) is 4 right of centre $\rightarrow$ 8 right; (2, 4) is 2 above centre $\rightarrow$ 4 above	M1
(a)	(2, 2), (10, 2), (2, 6)	A1

Q20 Grade 5 Teachably style

Total: 3

Part	Mark scheme	Marks
(a)	test with the point (1, 1): reflecting in the x-axis gives (1, -1)	M1
(a)	reflecting (1, -1) in the y-axis gives (-1, -1)	M1
(a)	rotation of 180° about the origin	A1

END OF PAPER

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