4.16 Transformations: Reflection and Rotation: 30-minute Pack

Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Stretch question. The right-angled triangle with vertices P(1, 0), Q(4, 0) and R(1, 3) is first rotated 90 degrees clockwise about the point P(1, 0), then reflected in the line y = 0. Give the coordinates of P', Q' and R' after both transformations.

(4)

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2 The points A (-4, -4) and B (-4, 3) are reflected in the line x = -2. Write down the coordinates of the images A' and B'.

(2)

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3 The point P (0, 5) is rotated 180° anticlockwise about (2, 0). Write down the coordinates of the image of P.

(3)

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4 Reflect the triangle with vertices A(1, 1), B(4, 1) and C(1, 3) in the x-axis. Give the coordinates of A', B' and C'.

(2)

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5 A shape is transformed by a single transformation. Three of its points map as follows: (1, 2) to (2, -1), (6, 1) to (1, -6), (1, 3) to (3, -1).
Describe fully the single transformation.

(2)

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6 Point D is at (-2, 5). Reflect D in the line x = 0 then in the line y = 0. Write the final coordinates.

(1)

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7 Rotate point E(2, 0) 90 degrees anticlockwise about the origin. State the coordinates of the image.

(2)

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8 A square has vertices at (1, 1), (3, 1), (3, 3) and (1, 3). Rotate the whole square 90 degrees clockwise about the origin. Give the new coordinates in any order.

(3)

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9 A shape is reflected in the line y = x. Point G at (2, 5) is one vertex. Find the coordinates of G' after reflection in y = x.

(2)

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10 Describe fully the single transformation that maps triangle T with vertices (1, 2), (3, 2), (1, 5) onto triangle T' with vertices (-2, 1), (-2, 3), (-5, 1).

(2)

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Mark scheme · 4.16 Transformations: Reflection and Rotation: 30-minute Pack

Question 1

method for rotation about P shown, e.g. translate so P is origin and apply rotation rule	M1
apply rotation to at least two points correctly (examples: Q -> (1, -3), R -> (4, 0))	M1
reflect in y = 0 shown (y -> -y) for at least one point	M1
final points P'(1, 0), Q'(1, 3), R'(4, 0) cao (in any order)	A1

Answer: **P'(1, 0), Q'(1, 3), R'(4, 0)**

Question 2

A' = (0, -4)	B1
B' = (0, 3)	B1

Answer: **(0, -4), (0, 3)**

Question 3

vector from the centre to P found	M1
rotated correctly	M1
(4, -5) cao	A1

Answer: **(4, -5)**

Question 4

correct method: reflect y-values by negating them or show one reflected vertex, oe	M1
A'(1, -1), B'(4, -1), C'(1, -3) cao	A1

Answer: **A'(1, -1), B'(4, -1), C'(1, -3)**

Question 5

correct type of transformation identified	M1
rotation of 90 degrees clockwise about the origin cao	A1

Answer: **rotation of 90 degrees clockwise about the origin**

Question 6

(2, -5) cao	B1

Answer: **(2, -5)**

Question 7

correct rotation method: (x, y) -> (-y, x) or equivalent	M1
(0, 2) cao	A1

Answer: **(0, 2)**

Question 8

correct map for one or more vertices using (x, y) -> (y, -x) for 90 degrees clockwise	M1
correct mapping for remaining vertices or a consistent set	M1
images: (1, -1), (1, -3), (3, -1), (3, -3) cao (in any order)	A1

Answer: **(1, -1), (1, -3), (3, -1), (3, -3)**

Question 9

method: swap coordinates (x, y) -> (y, x) or equivalent	M1
(5, 2) cao	A1

Answer: **(5, 2)**

Question 10

identify type of transformation or show centre/angle partially	M1
rotation 90 degrees anticlockwise about the point (0, 0) oe	A1

Answer: **Rotation 90 degrees anticlockwise about the origin (0, 0)**

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