4.16 Transformations: Reflection and Rotation: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Reflect point P(3, 2) in the y-axis. Write down the coordinates of the image.

(1)

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2 The points A (3, -4) and B (5, -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 points A (-2, 1) and B (-6, 1) are reflected in the line y = -1. Write down the coordinates of the images A' and B'.

(2)

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4 The point P (0, -5) is rotated 90° anticlockwise about (-1, 0). Write down the coordinates of the image of P.

(3)

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5 A shape is transformed by a single transformation. Three of its points map as follows: (5, 3) to (-3, 5), (5, 4) to (-4, 5), (1, 5) to (-5, 1).
Describe fully the single transformation.

(2)

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6 The point P (3, 4) is reflected in the x-axis and the image is then translated by 3 units to the right and 3 units up (negative means left or down). Write down the coordinates of the final image.

(3)

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7 The point P (-1, 5) is reflected in the x-axis and the image is then translated by -1 units to the right and 2 units up (negative means left or down). Write down the coordinates of the final image.

(3)

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8 Rotate point F(0, -3) 180 degrees about the origin. Give the coordinates of the image.

(2)

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

(2)

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10 A shape is transformed by a single transformation. Three of its points map as follows: (3, 4) to (-4, -3), (2, 1) to (-1, -2), (5, 4) to (-4, -5).
Describe fully the single transformation.

(2)

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11 The point P (3, -1) is rotated 180° clockwise about (0, 1). Write down the coordinates of the image of P.

(3)

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12 Describe fully the single transformation that maps triangle T with vertices (2, 1), (4, 1), (2, 4) onto triangle T' with vertices (-1, 2), (-1, 4), (-4, 2).

(2)

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13 Reflect point J(4, -3) in the y-axis. Write down the coordinates of the image.

(1)

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14 A shape is rotated 360 degrees about any point. Describe the position of the image compared with the original shape.

(1)

15 Shape M has vertices (1, 1), (3, 1) and (1, 4). Shape N has vertices (-1, -1), (-3, -1) and (-1, -4). Describe fully the single transformation that maps shape M onto shape N.

(3)

16 Point M(2, -5) is rotated 90 degrees clockwise about the point (2, -1). Find the coordinates of the image M'.

(3)

17 A rectangle has corners at (0, -1), (4, -1), (4, 1) and (0, 1). First reflect the rectangle in the y-axis, then rotate the result 90 degrees anticlockwise about the origin. Give the final coordinates of the four vertices.

(3)

18 Rotate point E(3, 0) 90 degrees anticlockwise about the origin. State the coordinates of the image.

(2)

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19 A square has vertices at (2, 2), (5, 2), (5, 5) and (2, 5). Rotate the whole square 90 degrees clockwise about the origin. Give the new coordinates in any order.

(2)

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20 A shape is reflected in the line y = x. Point G at (3, 6) is one vertex. Find the coordinates of G' after reflection in y = x.

(2)

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Mark scheme · 4.16 Transformations: Reflection and Rotation: Test Pack

Question 1

(-3, 2) cao — **B1**

Answer: **(-3, 2)**

Question 2

A' = (-7, -4) — **B1**

B' = (-9, -3) — **B1**

Answer: **(-7, -4), (-9, -3)**

Question 3

A' = (-2, -3) — **B1**

B' = (-6, -3) — **B1**

Answer: **(-2, -3), (-6, -3)**

Question 4

vector from the centre to P found — **M1**

rotated correctly — **M1**

(4, 1) cao — **A1**

Answer: **(4, 1)**

Question 5

correct type of transformation identified — **M1**

rotation of 90 degrees anticlockwise about the origin cao — **A1**

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

Question 6

reflection carried out — **M1**

intermediate image (3, -4) — **A1**

(6, -1) cao — **A1**

Answer: **(6, -1)**

Question 7

reflection carried out — **M1**

intermediate image (-1, -5) — **A1**

(-2, -3) cao — **A1**

Answer: **(-2, -3)**

Question 8

method: (x, y) -> (-x, -y) or description — **M1**

(0, 3) cao — **A1**

Answer: **(0, 3)**

Question 9

correct type of transformation identified — **M1**

reflection in the line y = x cao — **A1**

Answer: **reflection in the line y = x**

Question 10

correct type of transformation identified — **M1**

reflection in the line y = -x cao — **A1**

Answer: **reflection in the line y = -x**

Question 11

vector from the centre to P found — **M1**

rotated correctly — **M1**

(-3, 3) cao — **A1**

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

Question 12

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)**

Question 13

(-4, -3) cao — **B1**

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

Question 14

identical position/unchanged, since 360 degrees is a full turn — **B1**

Answer: **The image is in exactly the same position as the original shape**

Question 15

recognises every coordinate of N is the negative of the matching coordinate of M — **M1**

states rotation of 180 degrees — **A1**

states centre (0, 0) cao — **A1**

Answer: **Rotation of 180 degrees about the origin (0, 0)**

Question 16

method: vector from centre (2, -1) to M is (0, -4) — **M1**

apply 90 degrees clockwise rule (x, y) -> (y, -x) to the vector: (-4, 0) — **A1**

M' = centre + rotated vector = (-2, -1) cao — **A1**

Answer: **(-2, -1)**

Question 17

reflect in y-axis: x -> -x shown for at least one vertex — **M1**

rotate 90 degrees anticlockwise: (x, y) -> (-y, x) shown for at least one reflected vertex — **M1**

final vertices (1, 0), (1, -4), (-1, -4), (-1, 0) cao (in any order) — **A1**

Answer: **(1, 0), (1, -4), (-1, -4), (-1, 0)**

Question 18

correct rotation method: (x, y) -> (-y, x) or equivalent — **M1**

(0, 3) cao — **A1**

Answer: **(0, 3)**

Question 19

correct map for at least one vertex using (x, y) -> (y, -x) for 90 degrees clockwise — **M1**

images: (2, -2), (2, -5), (5, -5), (5, -2) cao (in any order) — **A1**

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

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Question 20

method: swap coordinates (x, y) -> (y, x) or equivalent **M1**

(6, 3) cao **A1**

Answer: **(6, 3)**

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