4.16 Transformations: Reflection and Rotation: 1-hour Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The points A (-2, 4) and B (1, 0) are reflected in the line x = -1. Write down the coordinates of the images A' and B'.

(2)

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2 The point P (1, -5) is reflected in the x-axis and the image is then translated by 0 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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3 The points A (5, 1) and B (-6, 0) are reflected in the line y = 3. Write down the coordinates of the images A' and B'.

(2)

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

(2)

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

(2)

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6 The point P (4, 2) is rotated 90° clockwise about (0, 1). Write down the coordinates of the image of P.

(3)

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7 The points A (-3, 0) and B (-6, 4) are reflected in the line y = x. Write down the coordinates of the images A' and B'.

(2)

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

(2)

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9 The point P (-1, 5) is reflected in the y-axis and the image is then translated by 3 units to the right and 4 units up (negative means left or down). Write down the coordinates of the final image.

(3)

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10 The point P (-4, -4) is reflected in the y-axis and the image is then translated by -2 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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11 The points A (3, -6) and B (-4, -1) are reflected in the line y = -x. Write down the coordinates of the images A' and B'.

(2)

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12 The point P (5, -2) is reflected in the y-axis and the image is then translated by -4 units to the right and 1 units up (negative means left or down). Write down the coordinates of the final image.

(3)

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13 The point P (-2, -1) is rotated 270° clockwise about (1, 1). Write down the coordinates of the image of P.

(3)

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

(2)

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15 Triangle with vertices A(2, 0), B(5, 0), C(2, 4) is rotated 270 degrees anticlockwise about the origin. Give the coordinates of A', B' and C'.

(3)

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16 Reflect the point (0, 5) in the x-axis. Write down the coordinates of the image.

(1)

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17 A rectangle has corners at (1, -2), (5, -2), (5, 0) and (1, 0). First rotate the rectangle 90 degrees anticlockwise about the origin, then reflect the result in the x-axis. Give the final coordinates of the four vertices.

(3)

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18 A logo designer reflects point L(6, -2) in the horizontal line y = -1. Find the coordinates of the image L'.

(3)

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19 Reflect the triangle with vertices A(2, 1), B(5, 1) and C(2, 4) in the x-axis. Give the coordinates of A', B' and C'.

(2)

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Mark scheme · 4.16 Transformations: Reflection and Rotation: 1-hour Pack

Question 1

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

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

Question 2

reflection carried out	M1
intermediate image (1, 5)	A1
(1, 2) cao	A1

Answer: **(1, 2)**

Question 3

A' = (5, 5)	B1
B' = (-6, 6)	B1

Answer: **(5, 5), (-6, 6)**

Question 4

A' = (-5, 6)	B1
B' = (-1, -6)	B1

Answer: **(-5, 6), (-1, -6)**

Question 5

correct method (eg 90 degree turn of the position vector from the centre)	M1
(5, 5) cao	A1

Answer: **(5, 5)**

Question 6

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

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

Question 7

A' = (0, -3)	B1
B' = (4, -6)	B1

Answer: **(0, -3), (4, -6)**

Question 8

A' = (4, 5)	B1
B' = (-2, -3)	B1

Answer: **(4, 5), (-2, -3)**

Question 9

reflection carried out	M1
intermediate image (1, 5)	A1
(4, 9) cao	A1

Answer: **(4, 9)**

Question 10

reflection carried out	M1
intermediate image (4, -4)	A1
(2, -2) cao	A1

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

Question 11

A' = (6, -3)	B1
B' = (1, 4)	B1

Answer: **(6, -3), (1, 4)**

Question 12

reflection carried out	M1
intermediate image (-5, -2)	A1
(-9, -1) cao	A1

Answer: **(-9, -1)**

Question 13

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

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

Question 14

correct type of transformation identified	M1
reflection in the y-axis cao	A1

Answer: **reflection in the y-axis**

Question 15

correct mapping rule for 270 degrees anticlockwise (x, y) -> (y, -x) or equivalent	M1
apply to at least two points correctly	M1
A'(0, -2), B'(0, -5), C'(4, -2) cao	A1

Answer: **A'(0, -2), B'(0, -5), C'(4, -2)**

Question 16

(0, -5) cao	B1

Answer: **(0, -5)**

Question 17

rotate 90 degrees anticlockwise: (x, y) -> (-y, x) shown for at least one vertex	M1
reflect in x-axis: show y -> -y for at least one rotated vertex	M1
final vertices (2, -1), (2, -5), (0, -5), (0, -1) cao (in any order)	A1

Answer: **(2, -1), (2, -5), (0, -5), (0, -1)**

Question 18

method: distance from L to the line y = -1 is 1 unit (from -2 to -1)	M1
image is the same distance on the other side of the line: y = 0	A1
L' (6, 0) cao	A1

Answer: **(6, 0)**

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Question 19

correct method: reflect y-values by negating them or show one reflected vertex, oe	**M1**
A'(2, -1), B'(5, -1), C'(2, -4) cao	**A1**

Answer: **A'(2, -1), B'(5, -1), C'(2, -4)**

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