HIGHER

3.6 Geometric Transformations: Reflection, Rotation, Enlargement and Translation: 30-minute Pack

EDEXCEL 4MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Triangle LMN has vertices L(-3, 3), M(4, 5), N(-1, -3). Its image L'M'N' has vertices L'(0, -2), M'(-2, 5), N'(6, 0).
Describe fully the single transformation that maps LMN onto L'M'N'.

(Total for Question 1 is 4 marks)

2 Triangle PQR has vertices P(1, 0), Q(4, -4), R(-2, -1).
Triangle PQR is reflected in the line y = -3.
Write down the coordinates of the vertices of the image P'Q'R'.

(Total for Question 2 is 3 marks)

3 Triangle ABC has vertices A(2, 0), B(-5, -3), C(0, -1).
Triangle ABC is rotated 90 degrees clockwise about the point (1, -2).
Write down the coordinates of the vertices of the image A'B'C'.

(Total for Question 3 is 3 marks)

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4 Triangle ABC has vertices A(6, 3), B(-4, 6), C(3, 6).
Triangle ABC is translated to triangle A'B'C' with A' = (1, 5).
Describe fully the single transformation, and write down where B goes.

(Total for Question 4 is 3 marks)

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5 Triangle LMN has vertices L(0, 10), M(8, 4), N(0, 8). Its image L'M'N' has vertices L'(-1, 4), M'(3, 1), N'(-1, 3).
Describe fully the single transformation that maps LMN onto L'M'N'.

(Total for Question 5 is 4 marks)

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6 Triangle LMN has vertices L(0, 0), M(0, -5), N(1, 1). Its image L'M'N' has vertices L'(0, -4), M'(0, 1), N'(1, -5).
Describe fully the single transformation that maps LMN onto L'M'N'.

(Total for Question 6 is 3 marks)

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7 Triangle LMN has vertices L(5, 0), M(-4, 5), N(1, -1). Its image L'M'N' has vertices L'(-3, -2), M'(2, 7), N'(-4, 2).
Describe fully the single transformation that maps LMN onto L'M'N'.

(Total for Question 7 is 4 marks)

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Mark scheme · 3.6 Geometric Transformations: Reflection, Rotation, Enlargement and Translation: 30-minute Pack

Question 1

identifies a rotation (the shape is turned, with the same size)	**B1**
angle and direction: 90 degrees anticlockwise	**B1**
finds the centre, e.g. from the perpendicular bisectors of LL' and MM', or by testing a point	**M1**
centre (1, 2)	**A1**

Answer: Rotation of 90 degrees anticlockwise about (1, 2)

Question 2

each point and its image are the same perpendicular distance from the mirror line, on opposite sides	**M1**
at least two image vertices correct, e.g. P'(1, -6)	**A1**
P'(1, -6), Q'(4, -2), R'(-2, -5)	**A1**

Answer: P'(1, -6), Q'(4, -2), R'(-2, -5)

Question 3

uses the centre of rotation to find each vertex's position relative to the centre, then turns it	**M1**
at least two image vertices correct, e.g. A'(3, -3)	**A1**
A'(3, -3), B'(0, 4), C'(2, -1)	**A1**

Answer: A'(3, -3), B'(0, 4), C'(2, -1)

Question 4

vector = A' - A = [-5; 2]	**M1**
translation by the vector [-5; 2]	**A1**
B' = (-9, 8)	**A1**

Answer: Translation by the vector [-5; 2]; B' = (-9, 8)

Question 5

identifies an enlargement	**B1**
scale factor from a pair of corresponding sides or distances: 1/2	**M1**
centre found where the lines joining corresponding vertices meet	**M1**
Enlargement with scale factor 1/2, centre (-2, -2)	**A1**

Answer: Enlargement with scale factor 1/2, centre (-2, -2)

Question 6

identifies a reflection (the shape is flipped, with the same size)	**B1**
finds the midpoint of L and L' or the perpendicular bisector of this pair of points	**M1**
Reflection in the line y = -2	**A1**

Answer: Reflection in the line y = -2

Question 7

identifies a rotation (the shape is turned, with the same size)	**B1**
angle and direction: 90 degrees clockwise	**B1**
finds the centre, e.g. from the perpendicular bisectors of LL' and MM', or by testing a point	**M1**
centre (0, 3)	**A1**

Answer: Rotation of 90 degrees clockwise about (0, 3)

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