

Matrix Transformations

Revise this topic →



← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the **AQA Level 2 Certificate in Further Maths**. It may not be suitable for other courses.



Answer **all** questions in the spaces provided.

1 Write down the matrix for each of the following transformations

1 (a) A rotation 90° clockwise about the origin. **[1 mark]**

Answer _____

1 (b) A reflection in the x -axis. **[1 mark]**

Answer _____

1 (c) An enlargement, scale factor 5, centre the origin. **[1 mark]**

Answer _____

1 (d) A rotation 180° about the origin. **[1 mark]**

Answer _____

1 (e) A reflection in the line $y = -x$ **[1 mark]**

Answer _____





2 $A = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$

2 (a) The point $P(1, 1)$ is transformed by the matrix A .

Work out the coordinates of the image P' .

[2 marks]

$P' =$ _____

2 (b) The point $Q(x, y)$ is transformed by the matrix A^2

The image Q' has coordinates $(0, -1)$

Work out the values of x and y .

[3 marks]

$x =$ _____ $y =$ _____

$\frac{1}{10}$

Turn over ►



3 (a) $A(1, 0)$, $B(1, 1)$ and $C(0, 1)$ are vertices of the unit square $OABC$.

The square is mapped to $OA'B'C'$ under the transformation matrix $\mathbf{M} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

Work out the coordinates of A' , B' and C' .

[3 marks]

$A' =$ _____ $B' =$ _____ $C' =$ _____

3 (b) Describe fully the transformation represented by matrix \mathbf{M} .

[2 marks]





- 4 The unit square $OABC$ is transformed by the matrix $\begin{pmatrix} k & 0 \\ 0 & k \end{pmatrix}$ to the square $O'A'B'C'$
The diagonal of square $O'A'B'C'$ has length $\sqrt{50}$

Work out two possible values of k .

[4 marks]

$$k = \underline{\hspace{2cm}} \quad \text{or} \quad k = \underline{\hspace{2cm}}$$



5 $B = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$

The points $M(1, 5)$ and $N(3, 3)$ are transformed by matrix B to points M' and N'

5 (a) Work out the length of line $M'N'$ giving your answer in the form $a\sqrt{b}$ [4 marks]

Answer _____

5 (b) Circle the geometric shape formed by $MNN'M'$ [1 mark]

Parallelogram

Rhombus

Trapezium

Kite

$\frac{5}{5}$