

# Combining 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.

Do not write  
outside the  
box

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

Describe geometrically the single transformation represented by **A** [1 mark]

Answer \_\_\_\_\_  
\_\_\_\_\_

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

Describe geometrically the single transformation represented by **A<sup>2</sup>** [2 marks]

Answer \_\_\_\_\_  
\_\_\_\_\_





2 (a)  $P = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$       $Q = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$

Point  $A$  has coordinates  $(0, 1)$

$A$  is transformed by the matrix  $PQ$  to the point  $A'$

Find the coordinates of  $A'$

[3 marks]

$A' = ( \text{_____}, \text{_____} )$

2 (b) Describe geometrically the single transformation represented by  $PQ$

[1 mark]

Answer \_\_\_\_\_

\_\_\_\_\_





3 Here are three transformations in the  $x - y$  plane.

A: Rotation through  $90^\circ$  clockwise about the origin.

B: Reflection in the line  $y = x$

C: Transformation A followed by transformation B.

Use matrix multiplication to show that C is equivalent to a single reflection.

**[4 marks]**





4 Here are two transformations in the  $x - y$  plane.

A: Rotation through  $180^\circ$  clockwise about the origin.

B: Reflection in the line  $y = 0$

4 (a) Use matrix multiplication to find a single matrix **M** that represents transformation A followed by transformation B

[2 marks]

**M** = \_\_\_\_\_

4 (b) Describe geometrically the single transformation represented by **M**

[1 mark]

Answer \_\_\_\_\_

\_\_\_\_\_

$\frac{7}{7}$

Turn over ►





5 Here are two transformations in the  $x - y$  plane.

A: Rotation through  $90^\circ$  anticlockwise about the origin.

B: Enlargement, scale factor 3, centre the origin.

The point  $P$  is transformed to  $P'$  by transformation A followed by transformation B.

The coordinates of  $P'$  are  $(0, 3)$ .

Find the coordinates of  $P$

[4 marks]

$P = ( \text{_____}, \text{_____} )$





- 6 Use matrix multiplication to show that three successive rotations,  $90^\circ$  clockwise about the origin is equivalent to one rotation,  $90^\circ$  anticlockwise about the origin.

[3 marks]

$\frac{7}{7}$

