**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Maths Specialist - Investigation**

**Matrix Transformations**

**Investigation Part 1:** **Preparation activity**

A point in the - plane can be expressed as a 2 1 matrix: for example, the point (1, 2) can be written as.

This point can then be transformed into another point by multiplication by a matrix.

Transformation matrix point = Transformed point

[NB: The transformation matrix is pre-multiplied by the point.]

Questions 1

Use the shape joined by the co-ordinates 0(0,0), A(1,0), B(1,2) and C(0,2), to investigate the effect of 2x2 transformation matrices of these types:

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| Matrix | Calculation | Diagram | Effect – Shape, position, size |
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Question 2

Investigate the effect of a transformation by the following matrices, where k is a constant.

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Question 3

1. Find the area of rectangle

For each the matrices in question 1,

1. find the absolute value of the determinant of the matrix.
2. Find the area of the image of under the transformation.
3. Find the value of

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| --- | --- | --- | --- |
| Matrix | Determinant |  |  |
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1. What do you notice?

By using the same transformation matrices above investigate the effect on a different shape.

Can you predict the effect the transformation matrices will have?

Can you predict the area of the image after it has been transformed the matrix?

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