

Matrices 2

1. Describe the geometrical effect of the transformation matrix $\begin{pmatrix} 0 & 3 \\ 3 & 0 \end{pmatrix}$.
2. Find the transformation matrix that represents a rotation of 60° anticlockwise about the origin followed by a reflection on the x -axis
3. Given the matrix $A = \begin{pmatrix} 0 & 4 & 2 \\ 1 & 0 & 1 \\ -1 & -2 & -3 \end{pmatrix}$, show that $A^2 + A = kI$ for some constant k .
Obtain values of p and q such that $A^{-1} = pA + qI$.
4. Use Gaussian elimination to solve:
$$\begin{aligned} x - y + z &= 1 \\ x + y + 2z &= 0 \\ 2x - y + 3z &= 2. \end{aligned}$$

Given $A = \begin{pmatrix} 5 & 2 & -3 \\ 1 & 1 & -1 \\ -3 & -1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix}$, calculate AB .

Hence state the relationship between A and the matrix $C = \begin{pmatrix} 1 & -1 & 1 \\ 1 & 1 & 2 \\ 2 & -1 & 3 \end{pmatrix}$.