Matrices – A2 Further Mathematics P1

1. June/2022/Paper_7367/01/No.4

The vector **v** is an eigenvector of the matrix **N** with corresponding eigenvalue 4

The vector **v** is also an eigenvector of the matrix **M** with corresponding eigenvalue 3

Given that

$$\mathbf{NM}^2\mathbf{v} = \lambda\mathbf{v}$$

find the value of λ

Circle your answer.

[1 mark]

10 24 36 144

2. June/2022/Paper_7367/01/No.7

The matrix **M** is defined as

$$\mathbf{M} = \begin{bmatrix} 1 & 7 & -3 \\ 3 & 6 & k+1 \\ 1 & 3 & 2 \end{bmatrix}$$

where k is a constant.

(a) (i) Given that **M** is a non-singular matrix, find $\mathbf{M}^{-1}$ in terms of k

[5 marks]

(a) (ii) State any restrictions on the value of k

[1 mark]

(b) Using your answer to part **(a)(i)**, solve

$$x + 7y - 3z = 6$$
$$3x + 6y + 6z = 3$$
$$x + 3y + 2z = 1$$

[3 marks]