

Answer all questions

1. If $X = \begin{pmatrix} -2 & 0 \\ 5 & 1 \end{pmatrix}$ and $Y = \begin{pmatrix} 4 & -1 \\ 3 & 7 \end{pmatrix}$ determine
 - a. $2X - Y$
 - b. X^2
 - c. XY
2. $A = \begin{pmatrix} 3 & 5 \\ 1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 6 & 4 \\ -1 & -2 \end{pmatrix}$
 - a. Calculate the matrix product AB
 - b. If $C = \begin{pmatrix} x & -8 \\ 4 & y \end{pmatrix}$, and $2A + C = AB$, calculate the values of x and y
3. If $T = \begin{pmatrix} 2 & -3 \\ 1 & 2 \end{pmatrix}$ and $G = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$, calculate the matrix product TG
4. Given that $\begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 2 & 3 \\ -1 & 2 \end{pmatrix} \begin{pmatrix} -3 \\ 1 \end{pmatrix}$ determine the value of a and b
5. If $A = \begin{pmatrix} 2 & 1 \\ -3 & 4 \end{pmatrix}$, $B = \begin{pmatrix} x \\ 4 \end{pmatrix}$ and $C = \begin{pmatrix} 12 \\ x \end{pmatrix}$. Given that $AB = C$ calculate the value of x
6. A , B and C are (2×2) matrices such that $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$, $B = \begin{pmatrix} 5 & 3 \\ 3 & 2 \end{pmatrix}$ and $C = \begin{pmatrix} 14 & 0 \\ -9 & 5 \end{pmatrix}$,
determine
 - a. $3A$
 - b. B^{-1}
 - c. $3A + B^{-1}$
 - d. The value of a , b and c if $3A + B^{-1} = C$
7. Given that $M = \begin{pmatrix} 2 & 3 \\ -1 & x \end{pmatrix}$
 - a. Write down the determinant of M
 - b. Given that M is a singular matrix calculate the value of x
8. For the matrix $N = \begin{pmatrix} 4 & 2 \\ 5 & 3 \end{pmatrix}$
 - a. Determine $|N|$
 - b. Calculate N^{-1}
 - c. Show by calculation that $NN^{-1} = I$