

Class – 12th

Chapter-5

Subject Maths

Worksheet-19

Inverse of a Matrix and Linear Equations

1. If matrix A is $\begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & -2 \\ 1 & 0 & 3 \end{bmatrix}$ then find $adjA$ and prove that $A \cdot (adjA) = |A|I_3 = (adjA) \cdot A$.

2. If matrix $A = F(\alpha) = \begin{bmatrix} \cos \alpha & -\sin \alpha & 0 \\ \sin \alpha & \cos \alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ then find A^{-1} and prove that

(i) $A^{-1}A = I_3$

(ii) $A^{-1} = F(-\alpha)$

(iii) $A \cdot (adjA) = |A|I = (adjA) \cdot A$

3. If matrix $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}$ the prove that $A^{-1} = A^3$

4. If $A = \begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}$ and $B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ then find $(AB)^{-1}$

5. If $A = \begin{bmatrix} 1 & \tan \alpha \\ -\tan \alpha & 1 \end{bmatrix}$ then prove that $A^T A^{-1} = \begin{bmatrix} \cos 2\alpha & -\sin 2\alpha \\ \sin 2\alpha & \cos 2\alpha \end{bmatrix}$

6. If matrix $A = \begin{bmatrix} -8 & 5 \\ 2 & 4 \end{bmatrix}$ then prove that $A^2 + 4A - 42I = 0$ then find A^{-1}