

TEST -13**CLASS 10+2****MATRICES AND DETERMINANTS**

1. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, prove that $A^n = \begin{bmatrix} 1+2n & -4n \\ n & 1-2n \end{bmatrix}$ for all natural numbers n.

2. If $A = \begin{bmatrix} 3 \\ 5 \\ 2 \end{bmatrix}$ and $B = [1 \ 0 \ 4]$ verify that $(AB)' = B' A'$.

3. By using elementary row transformations, find inverse $\begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$

4. By using elementary column transformations find inverse $\begin{bmatrix} 1 & -2 \\ 4 & 5 \end{bmatrix}$.

5. Prove that $\begin{bmatrix} 1+a^2-b^2 & 2ab & -2b \\ 2ab & 1-a^2+b^2 & 2a \\ 2b & -2a & 1-a^2-b^2 \end{bmatrix} = (1+a^2+b^2)^3$.

6. For the matrix $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$, find the numbers a and b such that $A^2 + aA + bI = 0$. Hence find A^{-1} .

7. Use matrix method to solve

$$x - y + z = 4, \quad 2x + y - 3z = 0, \quad x + y + z = 2.$$