

Sri Pratyangira Institute
IIT/JEE-NEET

{Plot no. – 2, 3A Sector 3, PNB Road, Rachna Vaishali, GZB, (U.P)}

(Mob. no. 9871948232, 8742904739)

DPP – 02

Class - 12th

Matrices

Topics:

- **Addition and Properties of Addition.**

1. If $A = \begin{bmatrix} 2 & 3 & -5 \\ 1 & 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 5 & 1 \\ -2 & 7 & 3 \end{bmatrix}$, find $A + B$ and $A - B$.
2. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 7 & 2 \end{bmatrix}$, find $3A - 2B$.
3. If $A = \text{diag}(1 \ -1 \ 2)$ and $B = \text{diag}(2 \ 3 \ -1)$, find $A + B$, $3A + 4B$.
4. Simplify: $\cos \theta \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix} + \sin \theta \begin{bmatrix} \sin \theta & -\cos \theta \\ \cos \theta & \sin \theta \end{bmatrix}$.
5. Find X and Y , if $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.
6. Find x, y, z, t if $2 \begin{bmatrix} x & z \\ y & t \end{bmatrix} + 3 \begin{bmatrix} 1 & -1 \\ 0 & 2 \end{bmatrix} = 3 \begin{bmatrix} 3 & 5 \\ 4 & 6 \end{bmatrix}$.
7. Find non-zero values of x satisfying the matrix equation: $x \begin{bmatrix} 2x & 2 \\ 3 & x \end{bmatrix} + 2 \begin{bmatrix} 8 & 5x \\ 4 & 4x \end{bmatrix} = 2 \begin{bmatrix} x^2 + 8 & 24 \\ 10 & 6x \end{bmatrix}$.
8. Find a matrix X such that $2A + B + X = 0$, where $A = \begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 \\ 1 & 5 \end{bmatrix}$.
9. Find a matrix A such that $2A - 3B + 5C = 0$, where $B = \begin{bmatrix} -2 & 2 & 0 \\ 3 & 1 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 0 & -2 \\ 7 & 1 & 6 \end{bmatrix}$.
10. Find x, y satisfying the matrix equation: $x \begin{bmatrix} 2 \\ 1 \end{bmatrix} + y \begin{bmatrix} 3 \\ 5 \end{bmatrix} + \begin{bmatrix} -8 \\ -11 \end{bmatrix} = 0$.
11. If $A = \begin{bmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{bmatrix}$, then find the matrix X of order 3×2 such that $2A + 3X = 5B$.
12. The monthly incomes of Aryan and Babban are in the ratio 3: 4 and their monthly expenditures are in the ratio 5: 7. If each saves Rs.15000 per month, find their monthly incomes using matrix method. This problem reflects which value?