

## Mathematics Assignment For Class X

**General Directions For Students :** Whatever be the notes provided , everything must be copied in the maths copy and then do the homework in the same copy

### Chapter 8: Matrices (Part -3) Multiplication Of Matrices

- Two matrices A and B are said to be compatible for the product AB if and only if the number of columns in A is equal to the number of rows in B.
- If A is of order  $m \times n$  and B is of order  $n \times p$  then AB is of order  $m \times p$  as  
 $AB = [c_{ij}]_{mn}$  where  
(i,j)th element of AB = sum of the product of the elements of the ith row of A with corresponding elements of the jth column of B
- The product of matrices is not commutative
- Multiplication of matrices is associative
- the product of two matrices can be zero matrix without either factor being a zero matrix.

**Exercise 8.3 Q1.** If  $A = \begin{bmatrix} 3 & 5 \\ 4 & -2 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 \\ 4 \end{bmatrix}$ , is the product AB possible ? Give a reason .If yes find AB.

**Solution .** Since Number of columns in A (two) is equal to number of rows in B (two) the product AB is possible .

$$AB = \begin{bmatrix} 3 & 5 \\ 4 & -2 \end{bmatrix} \begin{bmatrix} 2 \\ 4 \end{bmatrix} = \begin{bmatrix} 3.2 + 5.4 \\ 4.2 + (-2)4 \end{bmatrix} = \begin{bmatrix} 26 \\ 0 \end{bmatrix} \text{ Ans}$$

**Exercise 8.3 Q.4.** Given  $A = \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix}$ , evaluate  $A^2 - 4A$

$$\text{Here } A^2 = \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix} = \begin{bmatrix} 1.1 + 1.8 & 1.1 + 1.3 \\ 8.1 + 3.8 & 8.1 + 3.3 \end{bmatrix} = \begin{bmatrix} 9 & 4 \\ 32 & 17 \end{bmatrix}$$

$$\text{Also } 4A = 4 \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix} = \begin{bmatrix} 4 & 4 \\ 32 & 12 \end{bmatrix}$$

$$\therefore A^2 - 4A = \begin{bmatrix} 9 & 4 \\ 32 & 17 \end{bmatrix} - \begin{bmatrix} 4 & 4 \\ 32 & 12 \end{bmatrix} = \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$$

### Homework

**Exercise 8.3 : Q.5, Q.7 , Q.8 , Q.9 , Q.10 ii), Q.11, Q.15 ii)**

Solution of Q2, Q3 , Q6 , Q12ii) is discussed in the video link given to you with this assignment.

We will continue with same exercise in the next assignment and video.