Date 30/07/2020
Class – XII th
Subject – Mathematics

Ex 3.4 (N.C.E.R.T.)

Q (1) Find A^{-1} if $A = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$

Solution.

Given

$$A = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$$

We write

$$A = IA$$

$$\Rightarrow \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} A$$

Applying $R_1 \to R_1 + R_2$, we get

$$\Rightarrow \begin{bmatrix} 2+(-1) & -3+2 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 1+0 & 0+1 \\ 0 & 1 \end{bmatrix} A$$

$$\Rightarrow \begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} A$$

$$\Rightarrow \begin{bmatrix} 1 & -1 \\ -1+1 & 2+(-1) \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0+1 & 1+1 \end{bmatrix} A$$ Applying $R_2 \to R_2 + R_1$

$$\Rightarrow \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix} A$$

Applying $R_1 \to R_1 + R_2$, we

$$\begin{bmatrix} 1+0 & -1+1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1+1 & 1+2 \\ 1 & 2 \end{bmatrix} A$$

$$\Rightarrow \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} A \quad (1)$$

Now comparing (1) with

$I = A^{-1} A$ (2), we get

$$A^{-1} = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$$ Ans

Q.(8) Matrices A and B will be inverse of each other if

(a) $AB = BA$ (b) $AB = BA = 0$ (c) $AB = 0, BA = 1$

& (d) $AA = BA = I$

Solution: We know that product of matrices & its reverse is a unit matrix.

$\therefore AB = BA = I$

So (d) is correct

—x—x—

chapter End