

# ASSIGNMENT 1

AI20MTECH11003

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## Question-

Find the cross product of  $\mathbf{a}$  and  $\mathbf{b}$ .

$$\mathbf{a} = \begin{pmatrix} 1 \\ -7 \\ 7 \end{pmatrix}$$

$$\mathbf{b} = \begin{pmatrix} 3 \\ -2 \\ 2 \end{pmatrix}$$

## Solution-

Cross Product of two vectors:

Cross product of two vectors is determined by spanning a vector into skew symmetric matrix

$$\mathbf{a} \times \mathbf{b} = \begin{pmatrix} 0 & -a_3 & a_2 \\ a_3 & 0 & -a_1 \\ -a_2 & a_1 & 0 \end{pmatrix} \begin{pmatrix} 3 \\ -2 \\ 2 \end{pmatrix} \quad (1)$$

$$\mathbf{a} \times \mathbf{b} = \begin{pmatrix} 0 & -7 & -7 \\ 7 & 0 & -1 \\ 7 & 1 & 0 \end{pmatrix} \begin{pmatrix} 3 \\ -2 \\ 2 \end{pmatrix} \quad (2)$$

$$\mathbf{a} \times \mathbf{b} = \begin{pmatrix} 0 \\ 19 \\ 19 \end{pmatrix} \quad (3)$$