SATISH KUMAR

Exercise 1

(A)

(1) $\begin{pmatrix} 11 & -2 \\ -1 & -3 \end{pmatrix}\begin{pmatrix} 4 & 2 \\ 0 & 0 \end{pmatrix} \Rightarrow \begin{pmatrix} 44 & 22 \\ -4 & -2 \end{pmatrix}$

(2) $\begin{pmatrix} -1 & 1 & -1 \\ 5 & 0 & 5 \end{pmatrix}\begin{pmatrix} 2 & -2 & -1 & 5 \\ 1 & -1 & 1 & 6 \\ -2 & 1 & -1 & 1 \end{pmatrix} \Rightarrow \begin{pmatrix} 1 & 0 & 3 & 0 \\ 0 & -5 & -10 & 30 \end{pmatrix}$

(3) $\begin{pmatrix} 3 & -1 \\ 2 & 2 \\ 4 & 4 \end{pmatrix}\begin{pmatrix} 1 & -2 & 1 \\ -1 & 3 & -1 \\ -12 & 4 & -2 \end{pmatrix} \Rightarrow$ Not defined.

(4) $\begin{pmatrix} 3 & -2 \\ 2 & -1 \end{pmatrix}\begin{pmatrix} -1 & -3 & 2 \\ 2 & -21 & 3 \end{pmatrix} \Rightarrow \begin{pmatrix} -7 & 33 & 0 \\ -4 & 15 & 1 \end{pmatrix}$

(B)

$AB = \begin{pmatrix} 1 & -2 \\ -3 & -2 \end{pmatrix}\begin{pmatrix} 3 & -2 \\ 3 & 2 \end{pmatrix} \Rightarrow \begin{pmatrix} -3 & -6 \\ -15 & 2 \end{pmatrix}$

$(AB)C = \begin{pmatrix} -3 & -6 \\ -15 & 2 \end{pmatrix}\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \Rightarrow \begin{pmatrix} -9 & -6 \\ -13 & 2 \end{pmatrix}$

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$$BC = \begin{pmatrix} 3 & -2 \\ 3 & 2 \end{pmatrix}\begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} = \begin{pmatrix} 1 & -2 \\ 5 & 2 \end{pmatrix}$$

$$A(BC) = \begin{pmatrix} 1 & -2 \\ -3 & -2 \end{pmatrix}\begin{pmatrix} 1 & -2 \\ 5 & 2 \end{pmatrix} \Rightarrow \begin{pmatrix} -9 & -6 \\ -13 & 2 \end{pmatrix}$$

C)

1) a 2x3 matrix times a 3x5 matrix $\Rightarrow$ a 2x5 matrix

(2) a 1x4 matrix times a 4x1 matrix
$\Rightarrow$ a 1x1 matrix

(3) a 2x3 matrix times a 2x3 matrix.
$\Rightarrow$ Not defined.

(4) a 4x4 matrix times a 4x4 matrix
$\Rightarrow$ a 4x4 matrix.