Monday, 14 November 2022 6:48 PM

Name: Subrat Kishore Dutta, Prathvish Mithare.

Student ID: 7028082, 7028692

email: subratkishoredutta1234@gmail.com, prathvishmithare7@gmail.com

Exercise 1:

Solution:

Let us consider $A = \begin{bmatrix} 2 & 4 \\ 2 & 0 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ $C = \begin{bmatrix} 1 & -1 \\ 1 & 2 \end{bmatrix}$

LHS: $(AB)C = \left(\begin{bmatrix} 2 & 4 \\ 2 & 0 \end{bmatrix}\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}\right)\begin{bmatrix} 1 & -1 \\ 1 & 2 \end{bmatrix}$

$(AB)C = \begin{bmatrix} 8 & 16 \\ 8 & 0 \end{bmatrix}\begin{bmatrix} 1 & -1 \\ 1 & 2 \end{bmatrix}$

$(AB)C = \begin{bmatrix} 24 & 24 \\ 8 & -8 \end{bmatrix} \longrightarrow ①$

RHS.

$A(BC) = \begin{bmatrix} 2 & 4 \\ 2 & 0 \end{bmatrix}\left(\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}\begin{bmatrix} 1 & -1 \\ 1 & 2 \end{bmatrix}\right)$

$A(BC) = \begin{bmatrix} 2 & 4 \\ 2 & 0 \end{bmatrix}\begin{bmatrix} 4 & -4 \\ 4 & 8 \end{bmatrix}$

$A(BC) = \begin{bmatrix} 24 & 24 \\ 8 & -8 \end{bmatrix} \longrightarrow ②$

Hence we have arrived at ① = ②//