Assignment 1
Latex Report

Fuzayil Bin Afzal Mir

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1 Exercise 2.17

]If $A = \begin{pmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -1 & 1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{pmatrix}$

then, verify that

$$1)(A + B)' = A' + B'$$

$$2)(A - B)' = A' - B'$$

1.1 Solution

$$1)(A + B)' = A' + B'$$

Since it's given $A = \begin{pmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -1 & 1 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{pmatrix}$

therefore,

L.H.S

$A+B = \begin{pmatrix} (-1+(-4)) & (2+1) & (3+(-5)) \\ (5+1) & (7+2) & (9+0) \\ (-1+1) & (1+3) & (1+1) \end{pmatrix}$

$A+B = \begin{pmatrix} -5 & 3 & -2 \\ 6 & 9 & 9 \\ 0 & 4 & 2 \end{pmatrix}$

Now,

$$(A + B)' = \begin{pmatrix} -5 & 6 & 0 \\ 3 & 9 & 4 \\ -2 & 9 & 2 \end{pmatrix}$$

Taking R.H.S

$$A' = \begin{pmatrix} -1 & 5 & -1 \\ 2 & 7 & 1 \\ 3 & 9 & 1 \end{pmatrix}$$

$$B' = \begin{pmatrix} -4 & 1 & 1 \\ 1 & 2 & 3 \\ -5 & 0 & 1 \end{pmatrix}$$

Adding,

$$A' and B'$$

$$A' + B' = \begin{pmatrix} -5 & 6 & 0 \\ 3 & 9 & 4 \\ -2 & 9 & 2 \end{pmatrix}$$

Now on comparing L.H.S and R.H.S we get,

$$L.H.S = R.H.S$$

$$(A + B)' = A' + B'$$

$$(2)(A - B)' = A' - B'$$

Since it's given A = $\begin{pmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -1 & 1 & 1 \end{pmatrix}$ and B = $\begin{pmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{pmatrix}$

therefore,

L.H.S

A-B = $\begin{pmatrix} (-1 - (-4)) & (2 - 1) & (3 - (-5)) \\ (5 - 1) & (7 - 2) & (9 - 0) \\ (-1 - 1) & (1 - 3) & (1 - 1) \end{pmatrix}$

A-B = $\begin{pmatrix} 3 & 1 & 8 \\ 4 & 5 & 9 \\ -2 & -2 & 0 \end{pmatrix}$

Now,

$$(A - B)' = \begin{pmatrix} 3 & 4 & -2 \\ 1 & 5 & -2 \\ 8 & 9 & 0 \end{pmatrix}$$

Taking R.H.S

$$A' = \begin{pmatrix} -1 & 5 & -1 \\ 2 & 7 & 1 \\ 3 & 9 & 1 \end{pmatrix}$$

$$B' = \begin{pmatrix} -4 & 1 & 1 \\ 1 & 2 & 3 \\ -5 & 0 & 1 \end{pmatrix}$$

Now Subtracting B' from A'

$$Hence, A' - B' = \begin{pmatrix} --1-(-4) & 5-1 & -1-1 \\ 2-1 & 7-2 & 1-3 \\ (3-(-5)) & 9-0 & 1-1 \end{pmatrix}$$

$$A' - B' = \begin{pmatrix} 3 & 4 & -2 \\ 1 & 5 & -2 \\ 8 & 9 & 0 \end{pmatrix}$$

Now on comparing L.H.S and R.H.S we get,

$$L.H.S = R.H.S$$

$$(A - B)' = A' - B'$$