Assignment-2
Latex Report

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- **Exercise 2.54**

1 Find X and Y, If X+Y = $\begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix}$ and X-Y = $\begin{pmatrix} 3 & 6 \\ 0 & -1 \end{pmatrix}$

1.1 Solution

Giving equation number to the given equations,
So let

$$X + Y = \begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix} \tag{1}$$

and

$$X - Y = \begin{pmatrix} 3 & 6 \\ 0 & -1 \end{pmatrix} \tag{2}$$

Now,

Adding eq(1) and eq(2)

X+Y+(X-Y)= $\begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix}$ + $\begin{pmatrix} 3 & 6 \\ 0 & -1 \end{pmatrix}$

X+Y+X-Y= $\begin{pmatrix} 8 & 8 \\ 0 & 8 \end{pmatrix}$

$$2X+0Y=\begin{pmatrix} 8 & 8 \\ 0 & 8 \end{pmatrix}$$

Or,

$$2X=\begin{pmatrix} 8 & 8 \\ 0 & 8 \end{pmatrix}$$

$$X = \frac{1}{2}\begin{pmatrix} 8 & 8 \\ 0 & 8 \end{pmatrix} \tag{3}$$

$$\tag{4}$$

Note: Scaler Multiplication:

If a matrix is multiplied by a constant K,then each element of that particular matrix are multiplied by the constant K to get the resulting matrix.

Similarly multiplying all the elements of the corresponding matrix by $\frac{1}{2}$

we get,

$$X = \begin{pmatrix} \frac{8}{2} & \frac{8}{2} \\ \frac{0}{2} & \frac{8}{2} \end{pmatrix}$$

$$X = \begin{pmatrix} 4 & 4 \\ 0 & 4 \end{pmatrix}$$

Since we found the value of X,we will substitute this value of X in equation (1)

The equation(1) is: $X+Y = \begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix}$

Now after substituting value of X

$$\begin{pmatrix} 4 & 4 \\ 0 & 4 \end{pmatrix} + Y = \begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix}$$

$$Y = \begin{pmatrix} 5 & 2 \\ 0 & 9 \end{pmatrix} - \begin{pmatrix} 4 & 4 \\ 0 & 4 \end{pmatrix}$$

Hence,

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

Also,

$$X = \begin{pmatrix} 4 & 4 \\ 0 & 4 \end{pmatrix}$$

P.T.O

- **Exercise 2.55**

2   Find the values of x and y from the following equation:

$$2\begin{pmatrix} x & 5 \\ 7 & y-3 \end{pmatrix} + \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

2.1   Solution:

$$2\begin{pmatrix} x & 5 \\ 7 & y-3 \end{pmatrix} + \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

Note: Scaler Multiplication:

If a matrix is multiplied by a constant K,then each element of that particular matrix are multiplied by the constant K to get the resulting matrix.

Similarly multiplying 2 to all elements of the corresponding matrix.

we get,

$$\begin{pmatrix} 2x & 10 \\ 14 & 2(y-3) \end{pmatrix} + \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

$$\begin{pmatrix} 2x & 10 \\ 14 & 2y-6 \end{pmatrix} + \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

$$\begin{pmatrix} 2x+3 & 10+(-4) \\ 14+1 & (2y-6)+2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

$$\begin{pmatrix} 2x + 3 & 6 \\ 15 & 2y - 4 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$$

Now, we get

$$2x + 3 = 7 \tag{5}$$

and

$$2y - 4 = 14 \tag{6}$$

Using equation(5) we get,
2x=7-3
2x=4

$$x = \frac{4}{2}$$

$$\boxed{x=2}$$

$$2y = 14 + 4$$
$$2y = 18$$
$$y = \frac{18}{2}$$

$$\boxed{y=9}$$

Hence, the we got the values x=2 and y=9.

The End