Exercise 9(A)

Solution:

(i) False.
The sum of matrices A + B is possible only when the order of both the matrices A and B are same.
(ii) True
(iii) False
Transpose of a 2 x 1 matrix is a 1 x 2 matrix.
(iv) True
(v) False
A column matrix has only one column and many rows.

1. Given: $\begin{bmatrix} x & y+2 \\ 3 & z-1 \end{bmatrix} = \begin{bmatrix} 3 & 1 \\ 3 & 2 \end{bmatrix}$**, find x, y and z.**
Solution:

If two matrices are said to be equal, then their corresponding elements are also equal.
Therefore,
x = 3,
y + 2 = 1 so, y = -1
z - 1 = 2 so, z = 3

2. Solve for a, b and c if
(i) $\begin{bmatrix} -4 & a+5 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} b+4 & 2 \\ 3 & c-1 \end{bmatrix}$
(ii) $\begin{bmatrix} a & a-b \\ b+c & 0 \end{bmatrix} = \begin{bmatrix} 3 & -1 \\ 2 & 0 \end{bmatrix}$
Solution:

If two matrices are said to be equal, then their corresponding elements are also equal.
Then,
(i) a + 5 = 2 ⇒ a = -3
-4 = b + 4 ⇒ b = -8
2 = c - 1 ⇒ c = 3
(ii) a = 3
a - b = -1

$\Rightarrow b = a + 1 = 4$
$b + c = 2$
$\Rightarrow c = 2 - b = 2 - 4 = -2$

3. If A = [8 -3] and B = [4 -5]; find:
(i) A + B (ii) B - A
Solution:
(i) A + B = [8 -3] + [4 -5] = [8+4 -3-5] = [12 -8]
(ii) B – A = [4 -5] - [8 -3] = [4-8 -5-(-3)] = [-4 -2]

4. If A= $\begin{bmatrix}2\\5\end{bmatrix}$**, B =** $\begin{bmatrix}1\\4\end{bmatrix}$ **and C =** $\begin{bmatrix}6\\-2\end{bmatrix}$**; find:**
(i) B + C (ii) A - C
(iii) A + B - C (iv) A - B +C
Solution:

(i)B + C = $\begin{bmatrix}1\\4\end{bmatrix}+\begin{bmatrix}6\\-2\end{bmatrix}=\begin{bmatrix}1+6\\4-2\end{bmatrix}=\begin{bmatrix}7\\2\end{bmatrix}$

(ii) A - C = $\begin{bmatrix}2\\5\end{bmatrix}-\begin{bmatrix}6\\-2\end{bmatrix}=\begin{bmatrix}2-6\\5+2\end{bmatrix}=\begin{bmatrix}-4\\7\end{bmatrix}$

(iii) $A + B - C = \begin{bmatrix}2\\5\end{bmatrix}+\begin{bmatrix}1\\4\end{bmatrix}-\begin{bmatrix}6\\-2\end{bmatrix}$

$=\begin{bmatrix}2+1-6\\5+4+2\end{bmatrix}=\begin{bmatrix}-3\\11\end{bmatrix}$

(iv) $A - B + C = \begin{bmatrix}2\\5\end{bmatrix}-\begin{bmatrix}1\\4\end{bmatrix}+\begin{bmatrix}6\\-2\end{bmatrix}$

$=\begin{bmatrix}2-1+6\\5-4-2\end{bmatrix}=\begin{bmatrix}7\\-1\end{bmatrix}$