Exercise 5b

Question 1.

If $A = \begin{bmatrix} 2 & -3 & 5 \\ -1 & 0 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 & -2 \\ 4 & -3 & 1 \end{bmatrix}$, verify that (A + B) = (B + A).

Answer:

A + B $= \begin{bmatrix} 2 & -3 & 5 \\ -1 & 0 & 3 \end{bmatrix} + \begin{bmatrix} 3 & 2 & -2 \\ 4 & -3 & 1 \end{bmatrix}$

$= \begin{bmatrix} 5 & -1 & 3 \\ 3 & -3 & 4 \end{bmatrix}$

B + A $= \begin{bmatrix} 3 & 2 & -2 \\ 4 & -3 & 1 \end{bmatrix} + \begin{bmatrix} 2 & -3 & 5 \\ -1 & 0 & 3 \end{bmatrix}$

$= \begin{bmatrix} 5 & -1 & 3 \\ 3 & -3 & 4 \end{bmatrix}$ = B + A

Therefore, A + B = B + A

This is true for any matrix

Conclusion: A + B = B + A

Question 2.

If $A = \begin{bmatrix} 3 & 5 \\ -2 & 0 \\ 6 & -1 \end{bmatrix}, B = \begin{bmatrix} -1 & -3 \\ 4 & 2 \\ -2 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 2 \\ 3 & -4 \\ 1 & 6 \end{bmatrix}$, verify that (A + B) + C = A + (B+C).

Answer:

(A+B)+C $= \left(\begin{bmatrix} 3 & 5 \\ -2 & 0 \\ 6 & -1 \end{bmatrix} + \begin{bmatrix} -1 & -3 \\ 4 & 2 \\ -2 & 3 \end{bmatrix} \right) + \begin{bmatrix} 0 & 2 \\ 3 & -4 \\ 1 & 6 \end{bmatrix}$

$= \left(\begin{bmatrix} 2 & 2 \\ 2 & 2 \\ 4 & 2 \end{bmatrix} \right) + \begin{bmatrix} 0 & 2 \\ 3 & -4 \\ 1 & 6 \end{bmatrix}$

$$= \begin{bmatrix} 2 & 4 \\ 5 & -2 \\ 5 & 8 \end{bmatrix}$$

A+(B+C) $= \begin{bmatrix} 3 & 5 \\ -2 & 0 \\ 6 & -1 \end{bmatrix} + \left(\begin{bmatrix} -1 & -3 \\ 4 & 2 \\ -2 & 3 \end{bmatrix} + \begin{bmatrix} 0 & 2 \\ 3 & -4 \\ 1 & 6 \end{bmatrix}\right)$

$$= \begin{bmatrix} 3 & 5 \\ -2 & 0 \\ 6 & -1 \end{bmatrix} + \left(\begin{bmatrix} -1 & -1 \\ 7 & -2 \\ -1 & 9 \end{bmatrix}\right)$$

$$= \begin{bmatrix} 2 & 4 \\ 5 & -2 \\ 5 & 8 \end{bmatrix}$$

Therefore, (A+B)+C = A+(B+C)

It is true for any matrix

Conclusion: (A+B)+C = A+(B+C)

Question 3.

If $A = \begin{bmatrix} 3 & 1 & 2 \\ 1 & 2 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 0 & 4 \\ 5 & -3 & 2 \end{bmatrix}$, find (2A – B).

Answer:

2A $= 2\left(\begin{bmatrix} 3 & 1 & 2 \\ 1 & 2 & -3 \end{bmatrix}\right)$

$$= \begin{bmatrix} 6 & 2 & 4 \\ 2 & 4 & -6 \end{bmatrix}$$

(2A-B) $= \begin{bmatrix} 6 & 2 & 4 \\ 2 & 4 & -6 \end{bmatrix} - \begin{bmatrix} -2 & 0 & 4 \\ 5 & -3 & 2 \end{bmatrix}$

$$= \begin{bmatrix} 8 & 2 & 0 \\ -3 & 7 & -8 \end{bmatrix}$$

Conclusion: (2A-B) $= \begin{bmatrix} 8 & 2 & 0 \\ -3 & 7 & -8 \end{bmatrix}$

Question 4.

Let $A=\begin{bmatrix}2 & 4\\3 & 2\end{bmatrix}, B=\begin{bmatrix}1 & 3\\-2 & 5\end{bmatrix}$ and $C=\begin{bmatrix}-2 & 5\\3 & 4\end{bmatrix}$. Find:

i. A + 2B

ii. B – 4c

iii. A – 2B + 3C

Answer:

A + 2B $=\begin{bmatrix}2 & 4\\3 & 2\end{bmatrix}+2(\begin{bmatrix}1 & 3\\-2 & 5\end{bmatrix})$

$=\begin{bmatrix}2 & 4\\3 & 2\end{bmatrix}+\begin{bmatrix}2 & 6\\-4 & 10\end{bmatrix}$

$=\begin{bmatrix}4 & 10\\-1 & 12\end{bmatrix}$

Conclusion: (A+2B) = $\begin{bmatrix}4 & 10\\-1 & 12\end{bmatrix}$

ii. B – 4c

B-4C $=\begin{bmatrix}1 & 3\\-2 & 5\end{bmatrix}-4(\begin{bmatrix}-2 & 5\\3 & 4\end{bmatrix})$

$=\begin{bmatrix}1 & 3\\-2 & 5\end{bmatrix}-\begin{bmatrix}-8 & 20\\12 & 16\end{bmatrix}$

$=\begin{bmatrix}9 & -17\\-14 & -11\end{bmatrix}$

Conclusion: B-4C $=\begin{bmatrix}9 & -17\\-14 & -11\end{bmatrix}$

iii. A – 2B + 3C

A-2B+3C $=\begin{bmatrix}2 & 4\\3 & 2\end{bmatrix}-2\left(\begin{bmatrix}1 & 3\\-2 & 5\end{bmatrix}\right)+3(\begin{bmatrix}-2 & 5\\3 & 4\end{bmatrix})$

$=\begin{bmatrix}2 & 4\\3 & 2\end{bmatrix}-\begin{bmatrix}2 & 6\\-4 & 10\end{bmatrix}+\begin{bmatrix}-6 & 15\\9 & 12\end{bmatrix}$

$= \begin{bmatrix} -6 & 13 \\ 16 & 4 \end{bmatrix}$

Conclusion: A_2B+3C $= \begin{bmatrix} -6 & 13 \\ 16 & 4 \end{bmatrix}$

Question 5.

Let $A = \begin{bmatrix} 0 & 1 & -2 \\ 5 & -1 & -4 \end{bmatrix}, B = \begin{bmatrix} 1 & -3 & -1 \\ 0 & -2 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -5 & 1 \\ -4 & 0 & 6 \end{bmatrix}$. Compute 5A – 3B + 4C.

Answer:

5A-3B+4C $= 5(\begin{bmatrix} 0 & 1 & -2 \\ 5 & -1 & -4 \end{bmatrix}) - 3(\begin{bmatrix} 1 & -3 & -1 \\ 0 & -2 & 5 \end{bmatrix}) + 4(\begin{bmatrix} 2 & -5 & 1 \\ -4 & 0 & 6 \end{bmatrix})$

$= (\begin{bmatrix} 0 & 5 & -10 \\ 25 & -5 & -20 \end{bmatrix}) - (\begin{bmatrix} 3 & -9 & -3 \\ 0 & -6 & 15 \end{bmatrix}) + (\begin{bmatrix} 8 & -20 & 4 \\ -16 & 0 & 24 \end{bmatrix})$

$= \begin{bmatrix} -3 & 14 & -7 \\ 25 & 1 & -35 \end{bmatrix} + \begin{bmatrix} 8 & -20 & 4 \\ -16 & 0 & 24 \end{bmatrix}$

$= \begin{bmatrix} 5 & -6 & -3 \\ 9 & 1 & -11 \end{bmatrix}$

Conclusion: 5A-3B+4C $= \begin{bmatrix} 5 & -6 & -3 \\ 9 & 1 & -11 \end{bmatrix}$

Question 6.

If $5A = \begin{bmatrix} 5 & 10 & -15 \\ 2 & 3 & 4 \\ 1 & 0 & -5 \end{bmatrix}$, find A.

Answer:

5A $= \begin{bmatrix} 5 & 10 & -15 \\ 2 & 3 & 4 \\ 1 & 0 & -5 \end{bmatrix}$

A $= \begin{bmatrix} \frac{5}{5} & \frac{10}{5} & \frac{-15}{5} \\ \frac{2}{5} & \frac{3}{5} & \frac{4}{5} \\ \frac{1}{5} & \frac{0}{5} & \frac{-5}{5} \end{bmatrix}$

$$A = \begin{bmatrix} 1 & 2 & -3 \\ \frac{2}{5} & \frac{3}{5} & \frac{4}{5} \\ \frac{1}{5} & 0 & -1 \end{bmatrix}$$

Conclusion: $A = \begin{bmatrix} 1 & 2 & -3 \\ \frac{2}{5} & \frac{3}{5} & \frac{4}{5} \\ \frac{1}{5} & 0 & -1 \end{bmatrix}$

Question 7.

Find matrices A and B, if $A + B = \begin{bmatrix} 1 & 0 & 2 \\ 5 & 4 & -6 \\ 7 & 3 & 8 \end{bmatrix}$ and $A - B = \begin{bmatrix} -5 & -4 & 8 \\ 11 & 2 & 0 \\ -1 & 7 & 4 \end{bmatrix}$.

Answer:
Add (A+B) and (A-B)

We get (A+B)+(A-B) $= \begin{bmatrix} 1 & 0 & 2 \\ 5 & 4 & -6 \\ 7 & 3 & 8 \end{bmatrix} + \begin{bmatrix} -5 & -4 & 8 \\ 11 & 2 & 0 \\ -1 & 7 & 4 \end{bmatrix}$

$$2A = \begin{bmatrix} -4 & -4 & 10 \\ 16 & 6 & -6 \\ 6 & 10 & 12 \end{bmatrix}$$

$$A = \begin{bmatrix} -2 & -2 & 5 \\ 8 & 3 & -3 \\ 3 & 5 & 6 \end{bmatrix}$$

Now Subtract (A-B) from (A+B)

(A+B)-(A-B) $= \begin{bmatrix} 1 & 0 & 2 \\ 5 & 4 & -6 \\ 7 & 3 & 8 \end{bmatrix} - \begin{bmatrix} -5 & -4 & 8 \\ 11 & 2 & 0 \\ -1 & 7 & 4 \end{bmatrix}$

$$(2B) = \begin{bmatrix} 6 & 4 & -6 \\ -6 & 2 & -6 \\ 8 & -4 & 4 \end{bmatrix}$$

$$B = \begin{bmatrix} 3 & 2 & -3 \\ -3 & 1 & -3 \\ 4 & -2 & 2 \end{bmatrix}$$

Conclusion: $A = \begin{bmatrix} -2 & -2 & 5 \\ 8 & 3 & -3 \\ 3 & 5 & 6 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 2 & -3 \\ -3 & 1 & -3 \\ 4 & -2 & 2 \end{bmatrix}$

Question 8.

Find matrices A and B, if $2A - B = \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}$ and $2B + A = \begin{bmatrix} 3 & 2 & 5 \\ -2 & 1 & -7 \end{bmatrix}$

Answer:
Add 2(2A-B) and (2B+A)

2(2A-B)+(2B+A) $= 2\left(\begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}\right) + \begin{bmatrix} 3 & 2 & 5 \\ -2 & 1 & -7 \end{bmatrix}$

$5A = \left(\begin{bmatrix} 12 & -12 & 0 \\ -8 & 4 & 2 \end{bmatrix}\right) + \begin{bmatrix} 3 & 2 & 5 \\ -2 & 1 & -7 \end{bmatrix}$

$5A = \begin{bmatrix} 15 & -10 & 5 \\ -10 & 5 & -5 \end{bmatrix}$

$A = \begin{bmatrix} 3 & -2 & 1 \\ -2 & 1 & -1 \end{bmatrix}$

$B = 2\left(\begin{bmatrix} 3 & -2 & 1 \\ -2 & 1 & -1 \end{bmatrix}\right) - \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}$

$= \begin{bmatrix} 6 & -4 & 2 \\ -4 & 2 & -2 \end{bmatrix} - \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix}$

$B = \begin{bmatrix} 0 & 2 & 2 \\ 0 & 0 & -3 \end{bmatrix}$

Conclusion: $A = \begin{bmatrix} 3 & -2 & 1 \\ -2 & 1 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 2 & 2 \\ 0 & 0 & -3 \end{bmatrix}$

(GIVEN ANSWER IS WRONG for question 8)

Question 9.

Find matrix X, if $\begin{bmatrix} 3 & 5 & -9 \\ -1 & 4 & -7 \end{bmatrix} + X = \begin{bmatrix} 6 & 2 & 3 \\ 4 & 8 & 6 \end{bmatrix}$.

Answer:
Given $\begin{bmatrix} 3 & 5 & -9 \\ -1 & 4 & -7 \end{bmatrix} + x = \begin{bmatrix} 6 & 2 & 3 \\ 4 & 8 & 6 \end{bmatrix}$

$$x = \begin{bmatrix} 6 & 2 & 3 \\ 4 & 8 & 6 \end{bmatrix} - \begin{bmatrix} 3 & 5 & -9 \\ -1 & 4 & -7 \end{bmatrix}$$

$$= \begin{bmatrix} 3 & -3 & 12 \\ 5 & 4 & 13 \end{bmatrix}$$

Conclusion : x $= \begin{bmatrix} 3 & -3 & 12 \\ 5 & 4 & 13 \end{bmatrix}$

Question 10.
If $A = \begin{bmatrix} -2 & 3 \\ 4 & 5 \\ 1 & -6 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 2 \\ -7 & 3 \\ 6 & 4 \end{bmatrix}$, find a matrix C such that A + B – C = O.

Answer:
Given A + B – C = 0

$$\begin{bmatrix} -2 & 3 \\ 4 & 5 \\ 1 & -6 \end{bmatrix} + \begin{bmatrix} 5 & 2 \\ -7 & 3 \\ 6 & 4 \end{bmatrix} - C = 0$$

$$C = \begin{bmatrix} -2 & 3 \\ 4 & 5 \\ 1 & -6 \end{bmatrix} + \begin{bmatrix} 5 & 2 \\ -7 & 3 \\ 6 & 4 \end{bmatrix}$$

$$C = \begin{bmatrix} 3 & 5 \\ -3 & 8 \\ 7 & -2 \end{bmatrix}$$

Conclusion: $C = \begin{bmatrix} 3 & 5 \\ -3 & 8 \\ 7 & -2 \end{bmatrix}$

Question 11.

Find the matrix X such that 2A – B + X = O,

where $A = \begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix}$.

Answer:
Given 2A – B + X = 0

$$2\left(\begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}\right) - \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix} + X = 0$$

$$X = \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix} - 2\left(\begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}\right)$$

$$= \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix} - \begin{bmatrix} 6 & 2 \\ 0 & 4 \end{bmatrix}$$

$$= \begin{bmatrix} -8 & -1 \\ 0 & -1 \end{bmatrix}$$

Conclusion: $X = \begin{bmatrix} -8 & -1 \\ 0 & -1 \end{bmatrix}$

Question 12.
If $A = \begin{bmatrix} 1 & -3 & 2 \\ 2 & 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 & -1 \\ 1 & 0 & -1 \end{bmatrix}$, find a matrix C such that (A + B + C) is a zero matrix.

Answer:
Given A+B+C is zero matrix i.e A+B+C = 0

$$\begin{bmatrix} 1 & -3 & 2 \\ 2 & 0 & 2 \end{bmatrix} + \begin{bmatrix} 2 & -1 & -1 \\ 1 & 0 & -1 \end{bmatrix} + C = 0$$

$$C = -\begin{bmatrix} 1 & -3 & 2 \\ 2 & 0 & 2 \end{bmatrix} - \begin{bmatrix} 2 & -1 & -1 \\ 1 & 0 & -1 \end{bmatrix}$$

$$= \begin{bmatrix} -3 & 4 & -1 \\ -3 & 0 & -1 \end{bmatrix}$$

Conclusion: $C = \begin{bmatrix} -3 & 4 & -1 \\ -3 & 0 & -1 \end{bmatrix}$

Question 13.
If A = diag [2, -5, 9], B = diag [-3, 7, 14] and C = diag [4, -6, 3], find:

(i) A + 2B

(ii)B + C – A

Answer:
If Z = diag[a,b,c], then we can write it as

$$Z = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$$

So, A+2B $= \begin{bmatrix} 2 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & 9 \end{bmatrix} + 2\left(\begin{bmatrix} -3 & 0 & 0 \\ 0 & 7 & 0 \\ 0 & 0 & 14 \end{bmatrix}\right)$

$$= \begin{bmatrix} 2 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & 9 \end{bmatrix} + \begin{bmatrix} -6 & 0 & 0 \\ 0 & 14 & 0 \\ 0 & 0 & 28 \end{bmatrix}$$

$$= \begin{bmatrix} 4 & 0 & 0 \\ 0 & 9 & 0 \\ 0 & 0 & 37 \end{bmatrix}$$

=diag[4,9,37]

Conclusion: A + 2B = diag[4,9,37]

(Given answer is wrong)

ii. B + C – A

If Z = diag[a,b,c], then we can write it as

$$Z = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$$

B+C-A $= \begin{bmatrix} -3 & 0 & 0 \\ 0 & 7 & 0 \\ 0 & 0 & 14 \end{bmatrix} + \begin{bmatrix} 4 & 0 & 0 \\ 0 & -6 & 0 \\ 0 & 0 & 3 \end{bmatrix} - \begin{bmatrix} 2 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & 9 \end{bmatrix}$

$$= \begin{bmatrix} -1 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 8 \end{bmatrix}$$

= diag[-1,6,8]

Conclusion: B+C-A = diag[-1,6,8]

iii. 2A + B – 5C

If Z = diag[a,b,c], then we can write it as

$$Z = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$$

2A+B-5C $= 2\left(\begin{bmatrix} 2 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & 9 \end{bmatrix}\right) + \begin{bmatrix} -3 & 0 & 0 \\ 0 & 7 & 0 \\ 0 & 0 & 14 \end{bmatrix} - 5(\begin{bmatrix} 4 & 0 & 0 \\ 0 & -6 & 0 \\ 0 & 0 & 3 \end{bmatrix})$

$$= \begin{bmatrix} 4 & 0 & 0 \\ 0 & -10 & 0 \\ 0 & 0 & 18 \end{bmatrix} + \begin{bmatrix} -3 & 0 & 0 \\ 0 & 7 & 0 \\ 0 & 0 & 14 \end{bmatrix} - \begin{bmatrix} 20 & 0 & 0 \\ 0 & -30 & 0 \\ 0 & 0 & 15 \end{bmatrix}$$

$$= \begin{bmatrix} -19 & 0 & 0 \\ 0 & 27 & 0 \\ 0 & 0 & 17 \end{bmatrix}$$

= diag[-19,27,17]

Conclusion: 2A + B – 5C = diag[-19,27,17]

(Given answer is wrong)

Question 14.
Find the value of x and y, when

i. $\begin{bmatrix} x+y \\ x-y \end{bmatrix} = \begin{bmatrix} 8 \\ 4 \end{bmatrix}$

Answer:

If $\begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} e & f \\ g & h \end{bmatrix}$,

Then a=e, b=f, c=g, d=h

Given $\begin{bmatrix} x+y \\ x-y \end{bmatrix} = \begin{bmatrix} 8 \\ 4 \end{bmatrix}$

So, x + y = 8 and x - y = 4

Adding these two gives 2x = 12

$\Rightarrow x = 6$

y =2

Conclusion : x = 6 and y =2

ii. $\begin{bmatrix} 2x+5 & 7 \\ 0 & 3y-7 \end{bmatrix} = \begin{bmatrix} x-3 & 7 \\ 0 & -5 \end{bmatrix}$

Given, $\begin{bmatrix} 2x+5 & 7 \\ 0 & 3y-7 \end{bmatrix} = \begin{bmatrix} x-3 & 7 \\ 0 & -5 \end{bmatrix}$

So, 2x+5 = x-3 and 3y-7 = -5

$\Rightarrow 3y = 2 \;\Rightarrow y = \frac{2}{3}$

$\Rightarrow 2x + 5 = x - 3 \;\Rightarrow x = -8$

Conclusion : x = -8 and y = $\frac{2}{3}$

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

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

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

2x+3 = 7 $\Rightarrow x = 2$

2y-4 = 14 $\Rightarrow y = 9$

Conclusion : x = 2 and y = 9

(Given answer is wrong)

Question 15.
Find the value of (x + y) from the following equation :

$$2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$$

Answer:
Given

$$2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 6 \\ 0 & 2x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$$

$$\begin{bmatrix} 2+y & 6 \\ 1 & 2x+2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$$

So, 2+y = 5 and 2x+2 = 8

i.e y = 3 and x = 3

Therefore, x+y=6

Conclusion: Therefore x+y = 6

Question 16.

If $\begin{bmatrix} x-y & 2y \\ 2y+z & x+y \end{bmatrix} = \begin{bmatrix} 1 & 4 \\ 9 & 5 \end{bmatrix}$ then write the value of (x + y).

Answer:

If $\begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} e & f \\ g & h \end{bmatrix}$,

Then a=e, b=f, c=g, d=h

Given, $\begin{bmatrix} x-y & 2y \\ 2y+z & x+y \end{bmatrix} = \begin{bmatrix} 1 & 4 \\ 9 & 5 \end{bmatrix}$,

So, x-y = 1, x+y =5, 2y = 4 and 2y+z = 9

Therefore, x+y = 5

Conclusion: x+y = 5

(Given answer is wrong)