4. For each of the following case, find (i) $(P - Q) - R$, (ii) $P - (Q - R)$.

(a) $P = \begin{bmatrix} 3 \\ 5 \\ -7 \end{bmatrix}$, $Q = \begin{bmatrix} 1 \\ 7 \\ 4 \end{bmatrix}$, $R = \begin{bmatrix} 0 \\ -2 \\ 2 \end{bmatrix}$

(b) $P = \begin{bmatrix} 4 & -1 \\ 5 & 3 \end{bmatrix}$, $Q = \begin{bmatrix} 8 & 9 \\ -10 & 3 \end{bmatrix}$, $R = \begin{bmatrix} 2 & 1 \\ -1 & 6 \end{bmatrix}$

For each of the cases, check whether $(P - Q) - R = P - (Q - R)$ or not.

5. If $A = \begin{bmatrix} 1 & 3 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 6 & 4 \\ 5 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$, find

(a) $A + B$,

(b) $C + A$,

(c) $B - C$,

(d) $A - B$.

6. Given that $P = \begin{bmatrix} 5 & -3 \\ 7 & 2 \end{bmatrix}$ and $Q = \begin{bmatrix} 4 & 6 \\ -1 & 3 \end{bmatrix}$, find

(i) matrix M such that $P + M = P$,

(ii) matrix N such that $N + Q = Q$.

7. Given that $\mathbf{X} = \begin{bmatrix} 12 & 5 \\ 9 & -1 \end{bmatrix}$, find matrix $\mathbf{Y}$ such that

$X + Y = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$.

8. If $\begin{bmatrix} 1 & 5 \\ 2 & -1 \end{bmatrix} + \begin{bmatrix} 1 & q \\ p & 4 \end{bmatrix} = \begin{bmatrix} r & 8 \\ 10 & s \end{bmatrix}$, find p, q, r and s.

9. Given that $\begin{bmatrix} 3 & 0 \\ -3 & p \end{bmatrix} - \begin{bmatrix} 4 & q \\ 0 & 5 \end{bmatrix} = \begin{bmatrix} x & 7 \\ y & 1 \end{bmatrix}$, find p, q, x and y.