

Question 1.3.5:

If $(3, 3)$, $(6, y)$, $(x, 7)$ and $(5, 6)$ are the vertices of a parallelogram taken in order, find the values of x and y .

Solution:

In a parallelogram, the diagonals bisect each other. Therefore, the midpoint of diagonal joining $(3, 3)$ and $(x, 7)$ is equal to the midpoint of diagonal joining $(6, y)$ and $(5, 6)$.

$$\mathbf{A} = \begin{pmatrix} 3 \\ 3 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 6 \\ y \end{pmatrix} \quad \mathbf{C} = \begin{pmatrix} x \\ 7 \end{pmatrix} \quad \mathbf{D} = \begin{pmatrix} 5 \\ 6 \end{pmatrix} \quad (1)$$

condition for the given points to form a parallelogram.

$$\mathbf{B} - \mathbf{A} = \mathbf{C} - \mathbf{D} \quad (2)$$

$$\mathbf{B} - \mathbf{A} = \begin{pmatrix} 3 \\ y - 3 \end{pmatrix} \quad \mathbf{C} - \mathbf{D} = \begin{pmatrix} x - 5 \\ 1 \end{pmatrix} \quad (3)$$

$$\therefore x = 8, y = 4$$

Final Answer: $x = 8, y = 4$

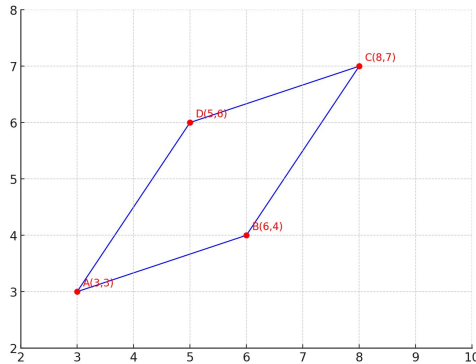


Fig. 1