

1.3.2

AI25BTECH11023 - Pratik R

Question:

The coordinates of the three consecutive vertices of a parallelogram $ABCD$ are $A(1, 3)$, $B(-1, 2)$, and $C(2, 5)$. Find the coordinates of the fourth vertex D .

Solution:

Given that

$$A = \begin{pmatrix} 1 \\ 3 \end{pmatrix}, B = \begin{pmatrix} -1 \\ 2 \end{pmatrix}, C = \begin{pmatrix} 2 \\ 5 \end{pmatrix}.$$

The coordinates of D of parallelogram $ABCD$ are obtained by equating midpoint of parallelogram:

$$\frac{D + B}{2} = \frac{A + C}{2} \quad (0.1)$$

$$D + B = A + C - B \quad (0.2)$$

$$D = \begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 2 \\ 5 \end{pmatrix} - \begin{pmatrix} -1 \\ 2 \end{pmatrix} \quad (0.3)$$

$$D = \begin{pmatrix} 4 \\ 6 \end{pmatrix} \quad (0.4)$$

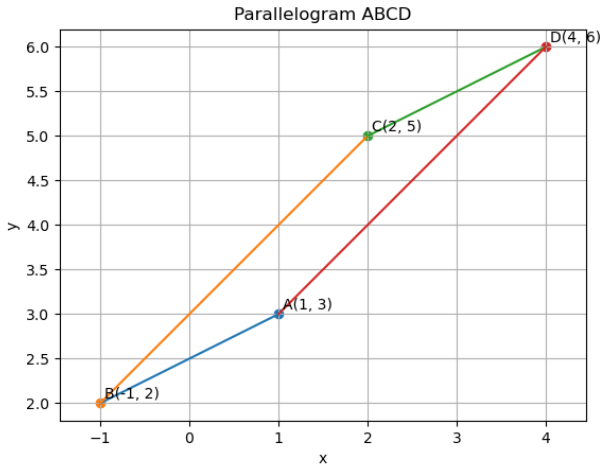


Fig. 0.1