AI24BTECH11017-Maanya Sri

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. (10,2021) **Sol:**

Label	Coordinate
A	(1,3)
В	(-1,2)
С	(2,5)
D	(x,y)

TABLE 0: Variables Used

Given
$$A = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$$
, $B = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$, and $C = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$
Let D be $\begin{pmatrix} x \\ y \end{pmatrix}$
In a parallelogram $A - B = D - C$

In a parallelogram A - B = D - CSo,

$$A - B = \begin{pmatrix} 1 \\ 3 \end{pmatrix} - \begin{pmatrix} -1 \\ 2 \end{pmatrix} = \begin{pmatrix} 2 \\ 1 \end{pmatrix} \tag{0.1}$$

$$D - C = \begin{pmatrix} x - 2 \\ y - 5 \end{pmatrix} \tag{0.2}$$

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Comparing both,

Solving for x and y,
we get
$$x=4$$
 and $y=6$
Hence $D = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$

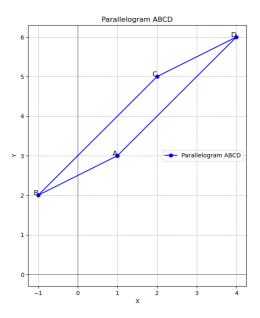


Fig. 0.1: parallelogram ABCD