1.2.12

EE24BTECH11020 - Ellanti Rohith

Question:
If (1,2), (4,y), (x,6) and (3,5) are the vertices of parallelogram taken in order, find x and y.

Solution:
Let ABCD be the given Parallelogram,

TABLE 0: Coordinates of the vertices of parallelogram ABCD

Vertex	Coordinates
A	(1, 2)
B	(4, y)
C	(x, 6)
D	(3, 5)

we know that AB is parallel to DC and $\|\|AB\|\| = \|\|DC\|\|$
Then,

$$B - A = C - D \tag{0.1}$$

$$\begin{pmatrix}4\\y\end{pmatrix} - \begin{pmatrix}1\\2\end{pmatrix} = \begin{pmatrix}x\\6\end{pmatrix} - \begin{pmatrix}3\\5\end{pmatrix} \tag{0.2}$$

$$\begin{pmatrix}3\\y-2\end{pmatrix} = \begin{pmatrix}x-3\\1\end{pmatrix} \tag{0.3}$$

From equation (0.3),

$$3 = x - 3 \Rightarrow x = 6 \tag{0.4}$$

$$y - 2 = 1 \Rightarrow y = 3 \tag{0.5}$$

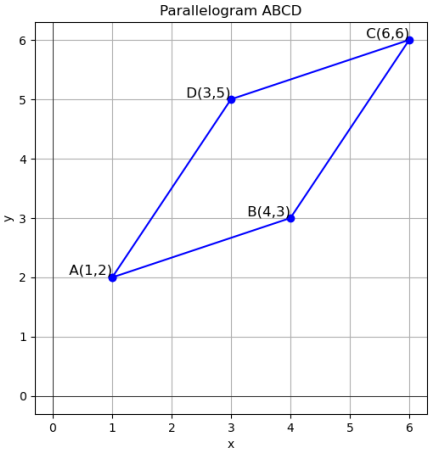

Fig. 0.1: Plot of parallelogram ABCD