1-1.3-2

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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)
B	(-1,2)
C	(2,5)
D	(x,y)

TABLE 0: Variables Used

In a parallelogram,

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

$$A - B = \begin{pmatrix}1\\3\end{pmatrix} - \begin{pmatrix}-1\\2\end{pmatrix} = \begin{pmatrix}2\\1\end{pmatrix} \tag{0.2}$$

$$D - C = \begin{pmatrix}x-2\\y-5\end{pmatrix} \tag{0.3}$$

$$\begin{pmatrix}2\\1\end{pmatrix} = \begin{pmatrix}x-2\\y-5\end{pmatrix} \tag{0.4}$$

$$x = 4, y = 6 \tag{0.5}$$

$$D = \begin{pmatrix}4\\6\end{pmatrix} \tag{0.6}$$

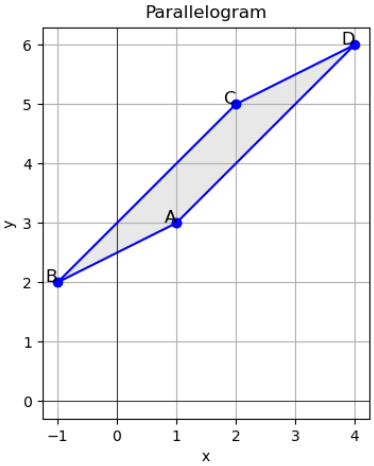

Fig. 0.1: parallelogram ABCD