ASSIGNMENT-2, 1.3.6

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Question: If $\begin{pmatrix}3\\3\end{pmatrix}$, $\begin{pmatrix}6\\y\end{pmatrix}$, $\begin{pmatrix}x\\7\end{pmatrix}$ and $\begin{pmatrix}5\\6\end{pmatrix}$ are the vertices of a parallelogram taken in order, find the values of x and y. (10, 2011)

Solution: Property: midpoints of diagnol coincide. Let **O** be the midpoint of the diagnols.

$$\mathbf{O} = \frac{\begin{pmatrix}3\\3\end{pmatrix} + \begin{pmatrix}x\\7\end{pmatrix}}{2} \tag{0.1}$$

$$\implies \mathbf{O} = \begin{pmatrix}\frac{3+x}{2}\\5\end{pmatrix} \tag{0.2}$$

$$\tag{0.3}$$

And

$$\mathbf{O} = \frac{\begin{pmatrix}6\\y\end{pmatrix} + \begin{pmatrix}5\\6\end{pmatrix}}{2} \tag{0.4}$$

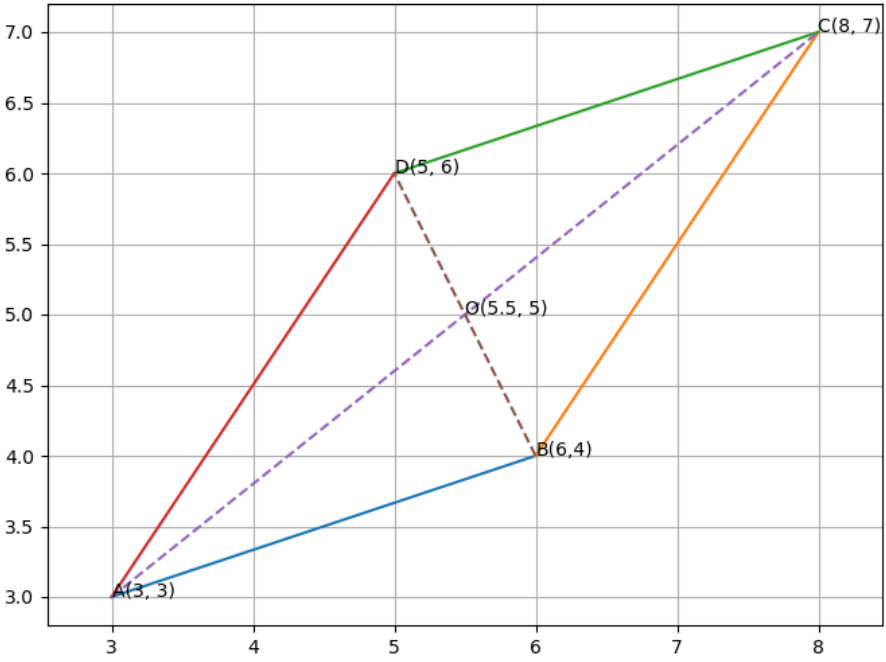
$$\implies \mathbf{O} = \begin{pmatrix}5.5\\\frac{6+y}{2}\end{pmatrix} \tag{0.5}$$

On comparing the two, we get (0.6)

$$x = 8 \tag{0.7}$$

$$y = 4 \tag{0.8}$$

$$\tag{0.9}$$


C(8, 7)
D(5, 6)
O(5.5, 5)
B(6,4)
A(3, 3)
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
3
4
5
6
7
8