ASSIGNMENT-2

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VECTOR ARITHMETIC(CBSE)

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.

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

from here we get $\mathbf{O} = \begin{pmatrix} \frac{(3+x)}{2} \\ 5 \end{pmatrix}$, we also have

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

this gives us $\mathbf{O} = \begin{pmatrix} 5.5 \\ \frac{y+6}{2} \end{pmatrix}$

On comparing the above two values of **O**, we get the values of x and y as:
$x = 8, y = 4$