

Assignment-2

EE224BTECH11044 - Muthyala Koushik

I. VECTOR ARITHMETIC(CBSE)

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

Solution: Property: Midpoints of the diagonals of parallelogram coincide.

Given vertices: $A\left(\begin{smallmatrix} 3 \\ 3 \end{smallmatrix}\right)$, $B\left(\begin{smallmatrix} 6 \\ y \end{smallmatrix}\right)$, $C\left(\begin{smallmatrix} x \\ 7 \end{smallmatrix}\right)$, $D\left(\begin{smallmatrix} 5 \\ 6 \end{smallmatrix}\right)$.

$$\text{Midpoint of AC} : \left(\frac{3+x}{2}, \frac{5}{2}\right) \quad (1)$$

$$\text{Midpoint of BD} : \left(\frac{11}{2}, \frac{y+6}{2}\right) \quad (2)$$

Equate midpoints:

$$\frac{3+x}{2} = \frac{11}{2} \implies x = 8 \quad (3)$$

$$5 = \frac{y+6}{2} \implies y = 4 \quad (4)$$

So, $x = 8$ and $y = 4$

