

# ASSIGNMENT-2

AI24BTECH11012-Pushkar Gudla

## VECTOR ARITHMETIC(CBSE)

- 1) 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:** We can find the values of  $x$  and  $y$  by finding the midpoint of the points that are on opposite ends of the diagonals. Let  $O$  be the midpoint of the diagonals.

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

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

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

this gives us  $O = \begin{pmatrix} 5.5 \\ (y+6)/2 \end{pmatrix}$

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

$$x = 8, y = 4$$