

1.5.37

EE24BTECH11019 - DWARAK A

Question:

The centre of a circle whose end points of a diameter are $(-6, 3)$ and $(6, 4)$ is _____ .

Solution:

| Point | Description |
|--------------------|---|
| A $(-6, 3)$ | First end-point of the circle's diameter |
| B $(6, 4)$ | Second end-point of the circle's diameter |
| C (x, y) | Centre of the circle |

TABLE 0: Variables Used

Center of a circle divides its diameter in the ration 1 : 1 internally.

Section Formula :

$$\mathbf{C} = \frac{k\mathbf{B} + \mathbf{A}}{k + 1} \quad (0.1)$$

Here,

$$k = 1 \quad (0.2)$$

From equations 0.1 and 0.2, the vector **C** is:

$$\mathbf{C} = \frac{\mathbf{A} + \mathbf{B}}{2} \quad (0.3)$$

$$\mathbf{C} = \frac{\begin{pmatrix} -6 \\ 3 \end{pmatrix} + \begin{pmatrix} 6 \\ 4 \end{pmatrix}}{2} \quad (0.4)$$

$$\mathbf{C} = \frac{\begin{pmatrix} 0 \\ 7 \end{pmatrix}}{2} \quad (0.5)$$

$$\mathbf{C} = \begin{pmatrix} 0 \\ 3.5 \end{pmatrix} \quad (0.6)$$

The coordinates of the center of the circle **C** is $\begin{pmatrix} 0 \\ 3.5 \end{pmatrix}$

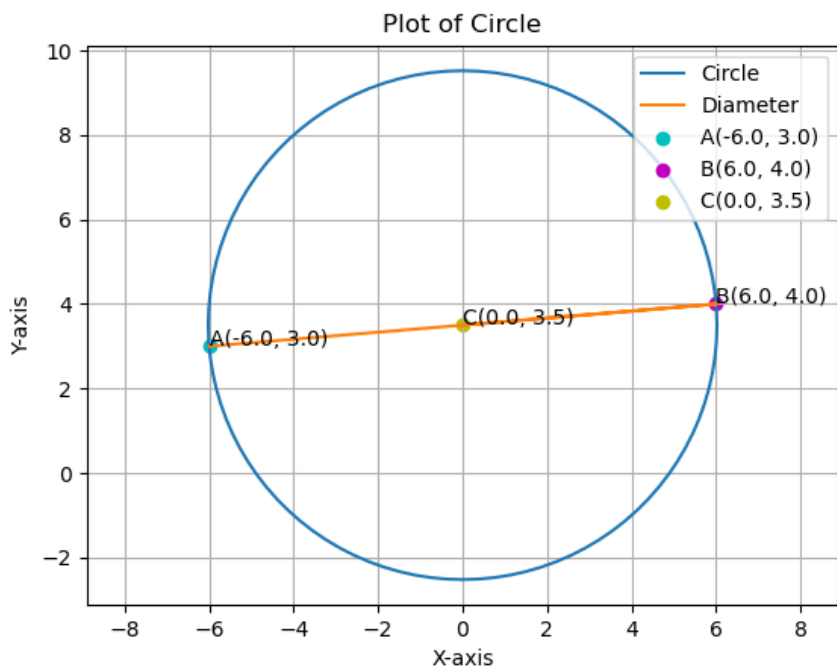


Fig. 0.1: Plot of end-points of diameter **A** and **B** and center of circle **C**