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 :

$$\mathbf{C} = \frac{k\mathbf{B} + \mathbf{A}}{k + 1} \tag{0.1}$$

Here,

$$k = 1 \tag{0.2}$$

From equations 0.1 and 0.2, the vector $\mathbf{C}$ is:

$$\mathbf{C} = \frac{\mathbf{A} + \mathbf{B}}{2} \tag{0.3}$$

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

$$\mathbf{C} = \frac{\begin{pmatrix} 0 \\ 7 \end{pmatrix}}{2} \tag{0.5}$$

$$\mathbf{C} = \begin{pmatrix} 0 \\ 3.5 \end{pmatrix} \tag{0.6}$$

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

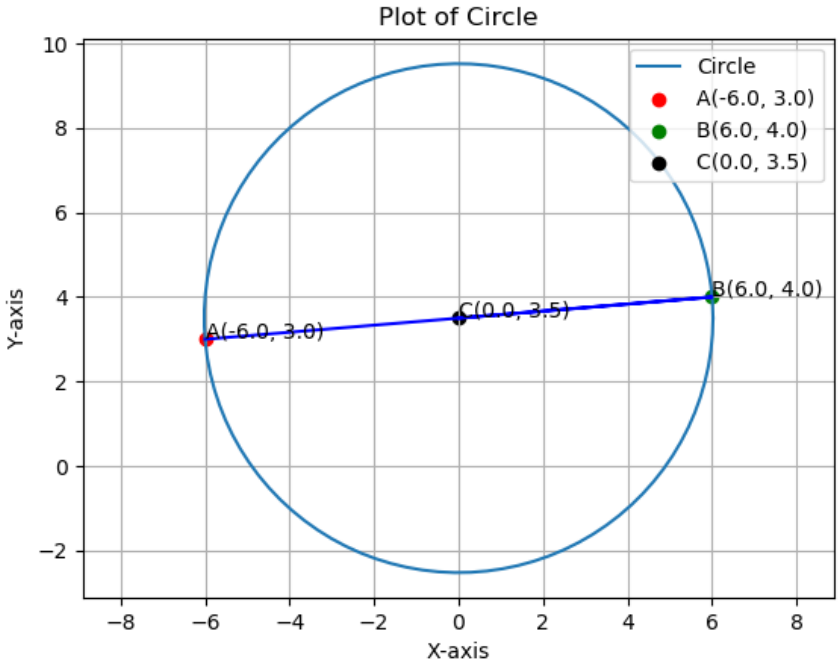

Fig. 0.1: Plot of end-points of diameter **A** and **B** and center of circle **C**