Solution for Question 1.5.16

AI24BTECH11035-Preethika

Question: Find the coordinates of a point A where AB is a diameter of the circle with center (3, -1) and the point B is (2, 6).

Point	Value	Description
C	$(3,-1)$	Centre of the cicle
B	$(2,6)$	Given point B
A	(x,y)	Coordinates of A

TABLE I
VARIABLES USED

Solution: Given,
Center of the circle $\vec{C} = (3,-1)$, and point $\vec{B} = (2,6)$.

Let the coordinates of point $\vec{A}$ be (x, y). Since AB is the diameter of the circle, the center is the midpoint of $\vec{A}$ and $\vec{B}$.

$$\vec{C} = \frac{\vec{A}+\vec{B}}{2} \tag{1}$$

$$= \frac{(x,y)+(2,6)}{2} \tag{2}$$

$$= \left(\frac{x+2}{2}, \frac{y+6}{2}\right). \tag{3}$$

Given the centre of the circle $\vec{C}$ is (3,-1),we can write

$$\left(\frac{x+2}{2}, \frac{y+6}{2}\right) = (3,-1) \tag{4}$$

By solving this two equations we get:

$$x = 4 \tag{5}$$

$$y = -8 \tag{6}$$

Therefore, the coordinates of point $\vec{A}$ are (4, -8).

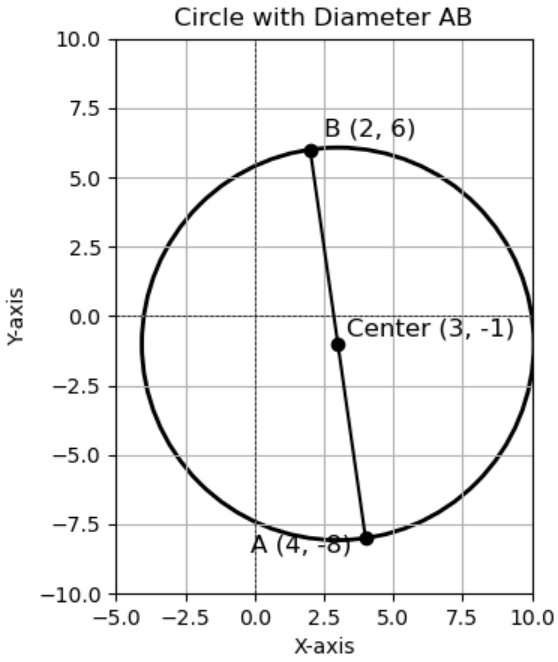

Fig. 1. Graph of the Circle with Diameter AB