1.5.16

EE25btech11028 - J.Navya sri

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 $(2,6)$.

Solution: let C be the center of circle

Point	vectors
B	$\begin{pmatrix}2\\6\end{pmatrix}$
C	$\begin{pmatrix}3\\-1\end{pmatrix}$

Circle center is the **midpoint** of diameter AB. So, midpoint formula:

$$\left(\frac{x_A + x_B}{2},\ \frac{y_A + y_B}{2}\right) = (3,-1)$$

Solve for x_A:

$$\frac{x_A + 2}{2} = 3 \quad \Rightarrow \quad x_A + 2 = 6 \quad \Rightarrow \quad x_A = 6 - 2 = 4$$

Solve for y_A:

$$\frac{y_A + 6}{2} = -1 \quad \Rightarrow \quad y_A + 6 = -2 \quad \Rightarrow \quad y_A = -2 - 6 = -8$$

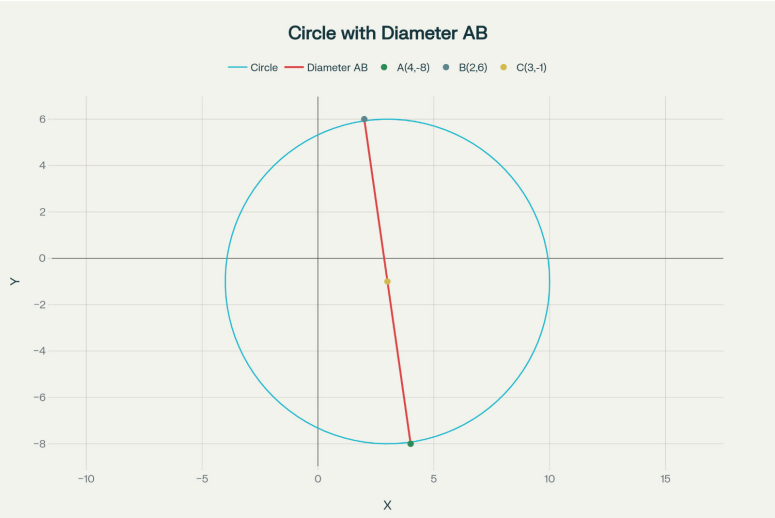
Hence,

$$A =$$

(4, -8)

Midpoint of $A(4,-8)$ and $B(2,6)$ is

$$\left(\frac{4+2}{2},\ \frac{-8+6}{2}\right) = (3,-1)$$


Circle with Diameter AB
Circle
Diameter AB
A(4,-8)
B(2,6)
C(3,-1)
6
4
2
0
−2
−4
−6
−8
Y
−10
−5
0
5
10
15
X