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

Given points:

A(x,y)
B(2,6)
C(3,-1)

As C is the center of the circle, it divides AB in 1 : 1 ratio. If P divides QR in k : 1 ratio, then

$$P = \frac{kR + 1(Q)}{k+1}$$

Now,

$$C = \left(\frac{A+B}{2}\right)$$

$$2\begin{pmatrix}3\\-1\end{pmatrix} = \begin{pmatrix}x\\y\end{pmatrix} + \begin{pmatrix}2\\6\end{pmatrix}$$

$$\begin{pmatrix}6\\-2\end{pmatrix} = \begin{pmatrix}x+2\\y+6\end{pmatrix}$$

$$x + 2 = 6 \quad \Rightarrow \quad x = 4$$

$$y + 6 = -2 \quad \Rightarrow \quad y = -8$$

Hence,

$$(x, y) = (4, -8)$$

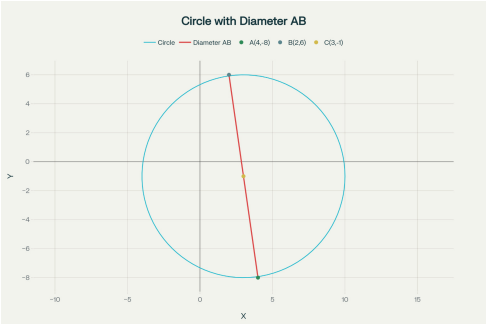

Fig. 0.1: Caption