

1.5.20

EE25BTECH11032 - Kartik Lahoti

Question:

Find the coordinates of a point A where AB is the diameter of the circle with center $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$ and B is the point $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$.

Solution:

Theory : Center of a circle is the mid-point of the diameter.

Let P be the center of the given circle , with AB as the diameter.

Let \mathbf{A} be the Vector to be found

$$\text{Given : } B \equiv \begin{pmatrix} 3 \\ 4 \end{pmatrix}, P \equiv \begin{pmatrix} -2 \\ 2 \end{pmatrix}$$

If \mathbf{P} is the mid point of \mathbf{AB}

$$\mathbf{P} = \frac{\mathbf{A} + \mathbf{B}}{2} \quad (0.1)$$

Substituting the given vectors , we get :

$$\mathbf{A} = 2 \begin{pmatrix} -2 \\ 2 \end{pmatrix} - \begin{pmatrix} 3 \\ 4 \end{pmatrix} \quad (0.2)$$

$$\mathbf{A} = \begin{pmatrix} -4 - 3 \\ 4 - 4 \end{pmatrix} \quad (0.3)$$

$$\therefore A \equiv \begin{pmatrix} -7 \\ 0 \end{pmatrix}$$

Hence , Coordinates of A are $\begin{pmatrix} -7 \\ 0 \end{pmatrix}$

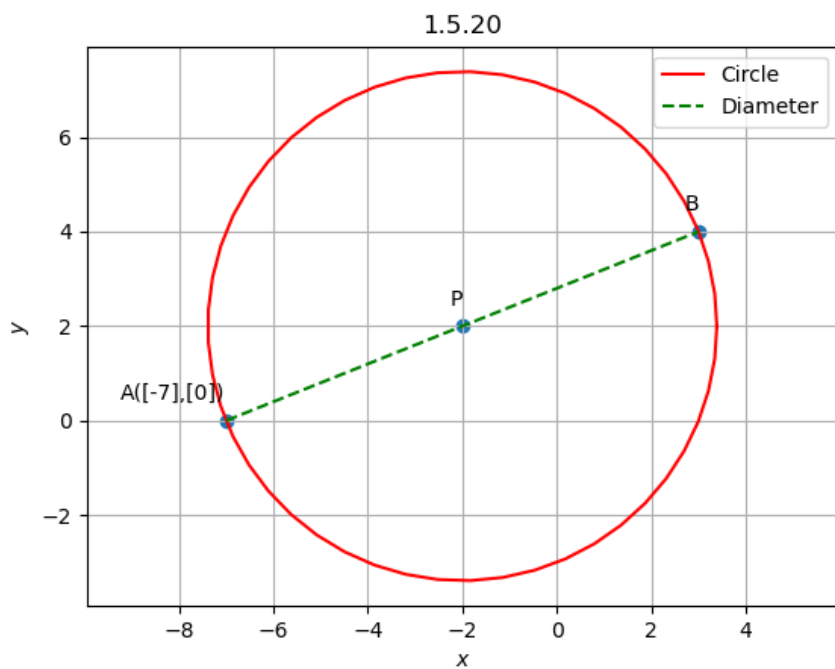


Fig. 0.1: Circle With Centre P