1.5.37

EE25BTECH11050-Hema Havil

Question:

The center of a circle whose end points of diameter are (-6,3) and (6,4) is _____

Solution:
Let the given end points of the diameter of the circle be A and B, then

$$\mathbf{A} = \begin{pmatrix} -6 \\ 3 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 6 \\ 4 \end{pmatrix} \tag{0.1}$$

The midpoint of the two points is the center of the circle,
let the center be C, then

$$\mathbf{C} = \frac{1}{2}(\mathbf{A} + \mathbf{B}) \tag{0.2}$$

by substituting A and B

$$\mathbf{C} = \frac{1}{2}\left(\begin{pmatrix} -6 \\ 3 \end{pmatrix} + \begin{pmatrix} 6 \\ 4 \end{pmatrix}\right) \tag{0.3}$$

$$\mathbf{C} = \frac{1}{2}\begin{pmatrix} -6+6 \\ 3+4 \end{pmatrix} \tag{0.4}$$

$$\mathbf{C} = \frac{1}{2}\begin{pmatrix} 0 \\ 7 \end{pmatrix} \tag{0.5}$$

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

Therefore, the center of the circle is

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

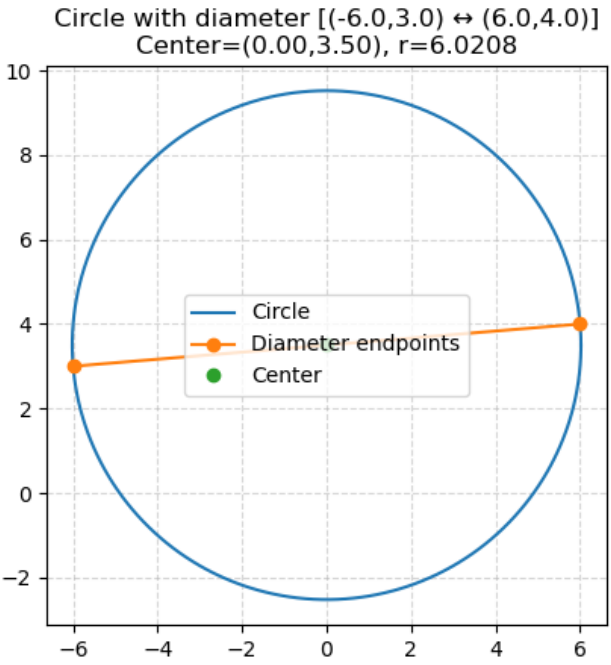

Fig. 0.1: Plot for the center of the cicle