

Question-7-7.2-8

EE24BTECH11033 - KOLLURU SURAJ

Question:

The centre of circle is $\left(\frac{2a}{a-7} \right)$. Find the values of a if the circle passes through the point

$A \left(\begin{matrix} 11 \\ -9 \end{matrix} \right)$ and has diameter $10\sqrt{2}$ units

Solution:

Description	Given value
Centre	$\left(\frac{2a}{a-7} \right)$
Diameter	$10\sqrt{2}$
point A	$\left(\begin{matrix} 11 \\ -9 \end{matrix} \right)$

TABLE 0: variables used

The radius of circle is $\frac{\text{diameter}}{2}$

$$\Rightarrow \text{radius} = 5\sqrt{2} \quad (0.1)$$

$$\|\mathbf{A} - \mathbf{C}\| = 5\sqrt{2} \quad (0.2)$$

$$\mathbf{A} - \mathbf{C} = \begin{pmatrix} 11 - 2a \\ -2 - a \end{pmatrix} \quad (0.3)$$

$$(11 - 2a)^2 + (2 + a)^2 = 50 \quad (0.4)$$

$$a^2 - 8a + 15 = 0 \quad (0.5)$$

$$(a - 3)(a - 5) = 0 \quad (0.6)$$

$$\therefore a = 3 \text{ or } a = 5 \quad (0.7)$$

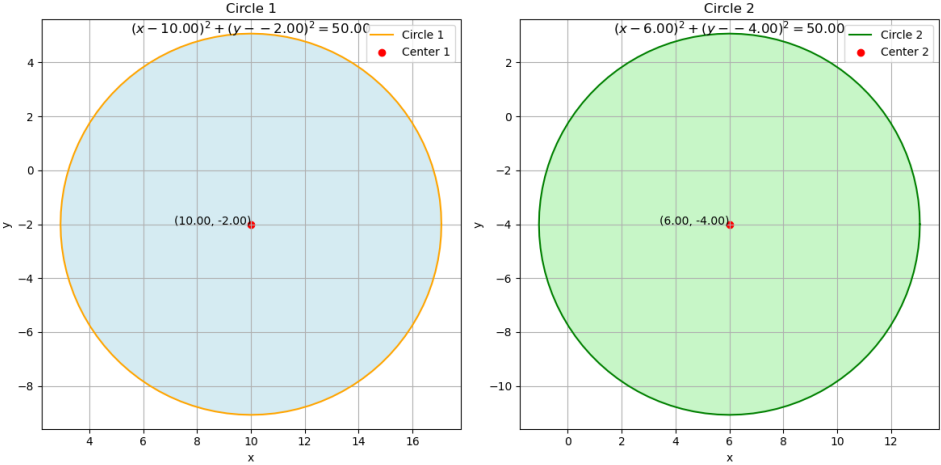


Fig. 0.1