

4.4.2.14

EE24BTECH11010 - Balaji B

Question:

$$x^2 + y^2 - 4x - 8y - 45 = 0$$

Solution:

Variable	Description
c	Centre of the Circle
<i>r</i>	Radius of the circle
u	Negative of Centre
<i>f</i>	Constant of the circle

TABLE I: Variables Used

The given circle can be expressed as

$$\|\mathbf{x}\|^2 + 2 \begin{pmatrix} -2 & -4 \end{pmatrix} \mathbf{x} - 45 = 0 \quad (1)$$

where

$$\mathbf{u} = \begin{pmatrix} -2 \\ -4 \end{pmatrix}, f = -45 \quad (2)$$

$$\mathbf{u} = -\mathbf{c} \quad (3)$$

$$\therefore \mathbf{c} = \begin{pmatrix} 2 \\ 4 \end{pmatrix} \quad (4)$$

$$r = \sqrt{\|\mathbf{u}\|^2 - f} \quad (5)$$

$$r = \sqrt{4 + 16 + 45} \quad (6)$$

$$r = \sqrt{65} \quad (7)$$

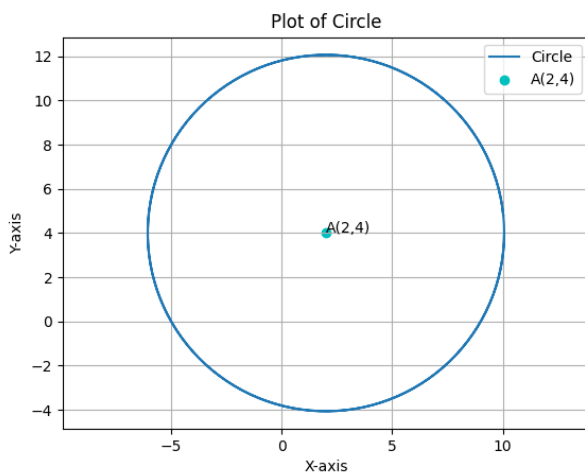


Fig. 1: Plot of the Circle