7-7.2-20

EE24BTECH11005 - Arjun Pavanje

Question:

Find the equation of a circle with centre $\begin{pmatrix}-2\\3\end{pmatrix}$ and radius 4

Variable	Description
c	Centre of circle
u	$-\mathbf{u} = \begin{pmatrix}2\\-3\end{pmatrix}$
r	Radius of Circle = 4

TABLE I: Variables Used

Solution: The equation of the line is given by,

$$f = \|\mathbf{u}\|^2 - r^2 = -3 \tag{1}$$

general equation of a circle is given by,

$$\|\mathbf{x}\|^2 + 2\mathbf{u}^\top\mathbf{x} + f = 0 \tag{2}$$

$$= \|\mathbf{x}\|^2 + 2\begin{pmatrix}2 & -3\end{pmatrix}\mathbf{x} - 3 = 0 \tag{3}$$

Required Circle Equation: $\|\mathbf{x}\|^2 + 2\begin{pmatrix}2 & -3\end{pmatrix}\mathbf{x} - 3 = 0$

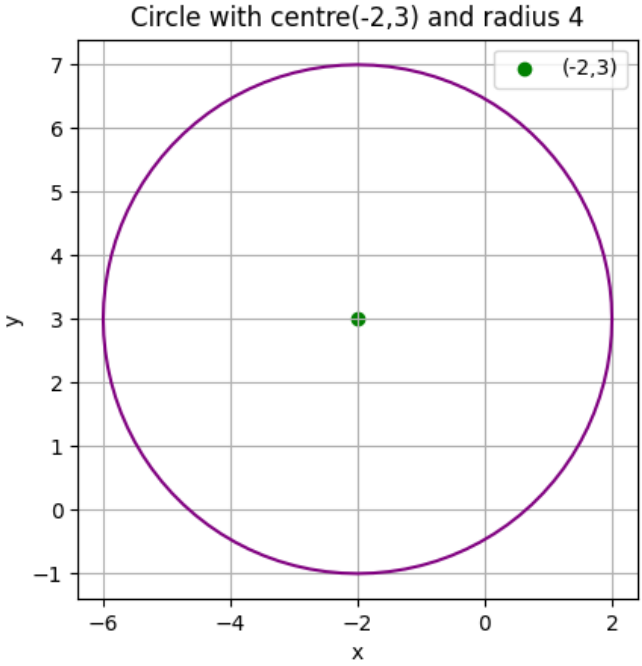

Fig. 1: Required Circle