7.4.20

EE25BTECH11013 - Bhargav

Question:
The point diametrically opposite to the point P $(1, 0)$ on the circle $x^2 + y^2 + 2x + 2y - 3 = 0$ is

Solution:
Let the diametrically opposite point be **Q**
The equation of the circle is:(**V** is an identity matrix of order = 2)

$$\mathbf{x^T V x} + 2\mathbf{u^T x} + f = 0 \tag{0.1}$$

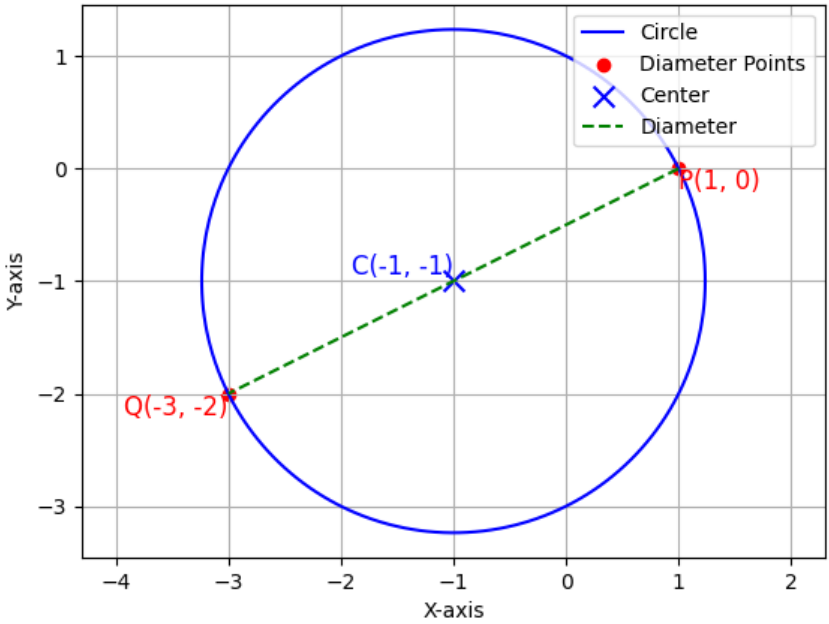
$$\mathbf{u} = \begin{pmatrix} u \\ v \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \end{pmatrix} \tag{0.2}$$

The center of the circle **c** is

$$\implies \mathbf{c} = -\mathbf{u} = \begin{pmatrix} -1 \\ -1 \end{pmatrix} \tag{0.3}$$

$$\mathbf{c} = \frac{\mathbf{P} + \mathbf{Q}}{2} \tag{0.4}$$

$$\mathbf{Q} = 2\mathbf{c} - \mathbf{P} = 2\begin{pmatrix} -1 \\ -1 \end{pmatrix} - \begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} -3 \\ -2 \end{pmatrix} \tag{0.5}$$


Circle
Diameter Points
Center
Diameter
P(1, 0)
C(-1, -1)
Q(-3, -2)
Y-axis
X-axis
1
0
−1
−2
−3
−4
−3
−2
−1
0
1
2