

Question: 11.11.1.15

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1 PROBLEM

Does the point $\begin{pmatrix} -2.5 \\ 3.5 \end{pmatrix}$ lie inside, outside or on the circle $x^2 + y^2 = 25$?

2 SOLUTION

Given circle equation is,

$$\|\mathbf{x}\|^2 = 25 \quad (2.0.1)$$

Condition	Inference
$\ \mathbf{x} - \mathbf{O}\ ^2 < r^2$	Point lies inside the circle
$\ \mathbf{x} - \mathbf{O}\ ^2 > r^2$	Point lies outside the circle
$\ \mathbf{x} - \mathbf{O}\ ^2 = r^2$	Point lies on the circle

TABLE 0: Table1

Here,

$$\|\mathbf{x} - \mathbf{O}\|^2 = \left\| \begin{pmatrix} -2.5 \\ 3.5 \end{pmatrix} \right\|^2 = 18.5 \quad (2.0.2)$$

$$r^2 = 25 \quad (2.0.3)$$

$$\Rightarrow \|\mathbf{x} - \mathbf{O}\|^2 < r^2 \quad (2.0.4)$$

Therefore, the point lies inside the given circle.

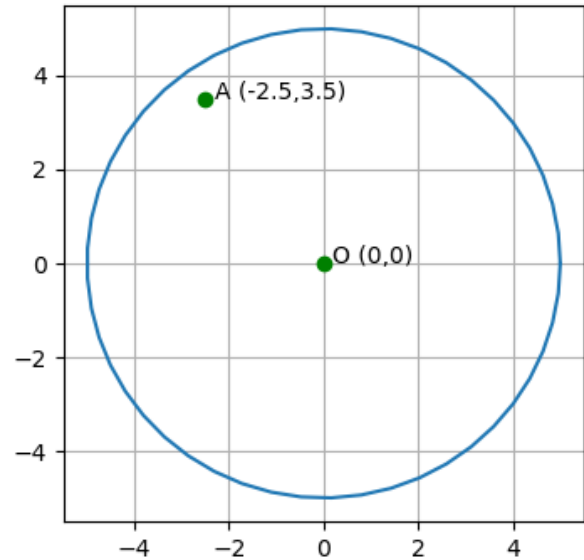


Fig. 0: Figure 1