7-7.2-31

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Question:
The point (1,2) lies inside the circle $x^2 + y^2 - 2x + 6y + 1 = 0$.

Sol:

Condition	Inference
$\|\|x - C\|\|^2 < r^2$	point lies inside the circle
$\|\|x - C\|\|^2 > r^2$	point lies outside the circle
$\|\|x - C\|\|^2 = r^2$	point lies on the circle

TABLE 0
GIVEN INFORMATION

The given circle equation can be expressed as

$$(x - 1)^2 + (y + 3)^2 = 9 \tag{0.1}$$

Let,

$$P = \begin{pmatrix} 1 \\ 2 \end{pmatrix} \tag{0.2}$$

Since

$$\|P - C\|^2 = (1 - 1)^2 + (2 + 3)^2 = 25 > 9, \tag{0.3}$$

the point lies outside the given circle.

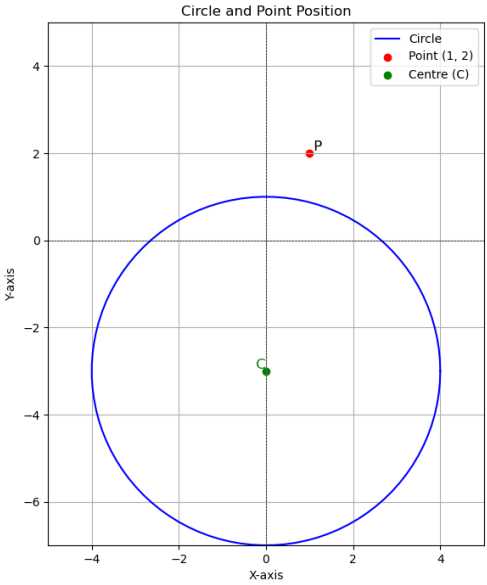

Fig. 0.1. Given circle and point