



## Solution

Circle radius given  $x^2 + y^2 + 10x - 6y + 18 = 0$ :  $r = 4$

## Steps

$$x^2 + y^2 + 10x - 6y + 18 = 0$$

## Circle Equation

$(x-a)^2 + (y-b)^2 = r^2$  is the circle equation with a radius  $r$ , centered at  $(a, b)$

Rewrite  $x^2 + y^2 + 10x - 6y + 18 = 0$  in the form of the standard circle equation

Hide Steps

$$x^2 + y^2 + 10x - 6y + 18 = 0$$

Move the loose number to the right side

$$x^2 + 10x - 6y + y^2 = -18$$

Group  $x$ -variables and  $y$ -variables together

$$(x^2 + 10x) + (y^2 - 6y) = -18$$

Convert  $x$  to square form

$$(x^2 + 10x + 25) + (y^2 - 6y) = -18 + 25$$

Convert to square form

$$(x + 5)^2 + (y^2 - 6y) = -18 + 25$$

Convert  $y$  to square form

$$(x + 5)^2 + (y^2 - 6y + 9) = -18 + 25 + 9$$

Convert to square form

$$(x + 5)^2 + (y - 3)^2 = -18 + 25 + 9$$

Refine  $-18 + 25 + 9$

$$(x + 5)^2 + (y - 3)^2 = 16$$

Rewrite in standard form

$$(x - (-5))^2 + (y - 3)^2 = 4^2$$

$$(x - (-5))^2 + (y - 3)^2 = 4^2$$

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Therefore the circle properties are:

$$(a, b) = (-5, 3), r = 4$$

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And the radius is:

$$r = 4$$

## Graph

Plotting:  $(x - (-5))^2 + (y - 3)^2 = 4^2$

