

5.7 Writing the Equations of Circles

Objective: Students will be able to write the equation of a circle

Key Skill: Completing the Square

What number needs to be added to each expression to make it a perfect square?

$$x^2 + 6x + \underline{\hspace{2cm}}$$

Take the number in front of
x, divide it by two, and
square the result

$$\frac{\quad}{2} = (\quad)^2 = \underline{\hspace{2cm}}$$

$$x^2 - 8x + \underline{\hspace{2cm}}$$

Take the number in front of
x, divide it by two, and
square the result

Find the length of the radius and the center of the circle with the equation below

$$(x - h)^2 + (y - k)^2 = r^2$$



We know this!

$$x^2 + y^2 + 6y = 16$$

$$\frac{\quad}{2} = (\quad)^2 = \underline{\hspace{2cm}}$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + 4x + y^2 - 8y = 29$$

$$\frac{\quad}{2} = (\quad)^2 = \underline{\quad}$$

$$\frac{\quad}{2} = (\quad)^2 = \underline{\quad}$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + y^2 + 10x - 2y = 55$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + y^2 - 6y - 12x + 14 = 0$$

Center: _____

Radius: _____

Independent Practice

What number needs to be added to each expression to make it a perfect square?

$x^2 + 4x + \underline{\quad}$

$x^2 - 14x + \underline{\quad}$

$x^2 + 20x + \underline{\quad}$

Find the length of the radius and the center of the circle with the equation below

$$x^2 + 4x + y^2 = 5$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + 6x + y^2 - 14y = 6$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + y^2 + 2x - 16y = 16$$

Center: _____

Radius: _____

Find the radius and the center of the circle with the equation below

$$x^2 + y^2 + 6y - 10y - 4 = 0$$

Center: _____

Radius: _____

Graph the circle with the given equation below

$$x^2 + y^2 + 8x - 20y + 15 = 0$$