Geometry
Equations of Circles

Name: _____
Date: _____

Equation of a Circle: $(x - h)^2 + (y - k)^2 = r^2$ **Radius:** r

Center: (h, k)

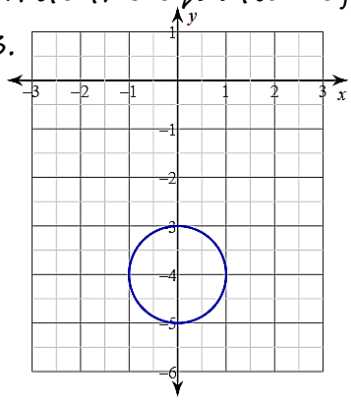
Use the following information to write the equation of the circle.

1. Center: (6, 13)
   Radius: 3

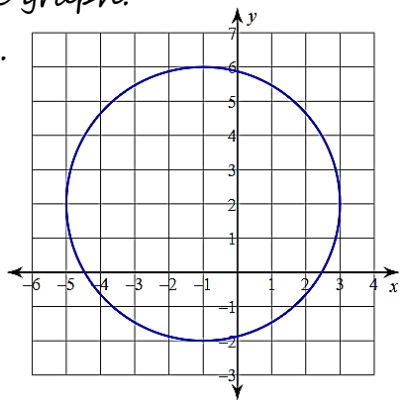
2. Center: (15, -8)
   Radius: 4

Write the equation of the circle from the graph.

3.

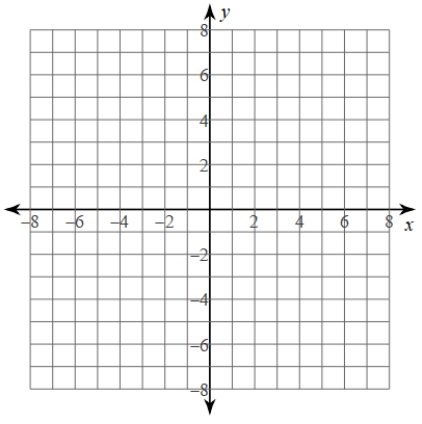


4.

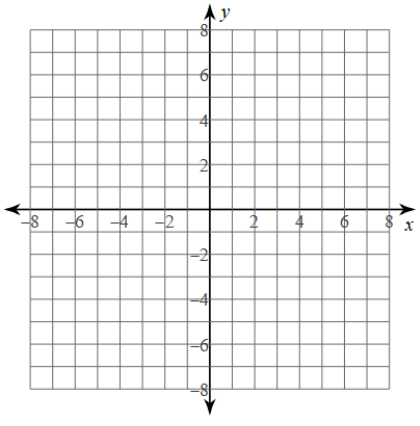


Identify the center and radius of the circle and then graph.

5. $(x + 2)^2 + y^2 = 25$



6. $(x - 1)^2 + (y + 2)^2 = 16$



Determine if the given point is inside, on, or outside the circle.

7. $(x - 3)^2 + (y - 1)^2 = 8$
   Point: (5, -1)

8. $(x + 1)^2 + (y + 1)^2 = 9$
   Point: (-2, 2)

DISTANCE FORMULA: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

1. Using the distance formula, write the equation of a circle whose center is (5, -3) and goes through (2, 5).

2. Using the distance formula, write the equation of a circle whose center is (4, -3) and goes through (1, 5).

3. If the center of a circle is at (1, -1) and the radius is 4, does the point (2, 3) lie on the circle?

MIDPOINT FORMULA: $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

1. What is the center of a circle whose diameters has endpoints at (-5, -4) and (-1, -4)?

2. Give the equation whose endpoints of a diameter are (-4, 1) and (4, -5).

3. Give the equation whose endpoints of a diameter are (-3, 2) and (1, -5).