

Circles in the Plane

Here is an equation for a circle, in General Form (like those we saw yesterday):

$$(x - 4)^2 + (y + 2)^2 = 16$$

1. What are h , and k in this example?

2. What is the center for this circle?

3. What is its radius? (recall that $x^2 + y^2 = r^2$)

4. Write out the following in expanded form:

a. $(x - 4)^2 =$

b. $(y + 2)^2 =$

5. Can you write out the full equation without any parentheses?

What do you notice about the coefficients?

Going the other way:

Here is another equation for a circle:

$$x^2 + y^2 + 4x - 12y = 9$$

This is written in Standard Form.

Can you identify:

- i. h , the x-coordinate of the center

- ii. k , the y-coordinate of the center

- iii. r , the radius (note: you need a couple of steps to get the radius)

Practice Problems

Name: _____

1.

The equation of a circle is $x^2 + y^2 - 6y + 1 = 0$.
What are the coordinates of the center and the length of the radius of this circle?

- 1) center $(0, 3)$ and radius $= 2\sqrt{2}$
- 2) center $(0, -3)$ and radius $= 2\sqrt{2}$
- 3) center $(0, 6)$ and radius $= \sqrt{35}$
- 4) center $(0, -6)$ and radius $= \sqrt{35}$

2.

A circle whose center is the origin passes through the point $(-5, 12)$. Which point also lies on this circle?

- 1) $(10, 3)$
- 2) $(-12, 13)$
- 3) $(11, 2\sqrt{12})$
- 4) $(-8, 5\sqrt{21})$

3. What is an equation of a circle whose center is at $(2, -4)$ and is tangent to the line $x = -2$?

- 1) $(x - 2)^2 + (y + 4)^2 = 4$
- 2) $(x - 2)^2 + (y + 4)^2 = 16$
- 3) $(x + 2)^2 + (y - 4)^2 = 4$
- 4) $(x + 2)^2 + (y - 4)^2 = 16$

4.

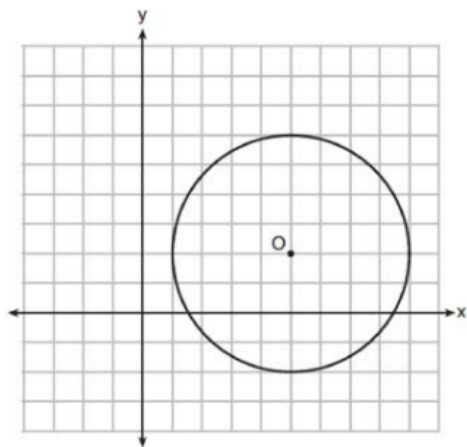
An equation of circle O is $x^2 + y^2 + 4x - 8y = -16$.

The statement that best describes circle O is the

- 1) center is $(2, -4)$ and is tangent to the x -axis
- 2) center is $(2, -4)$ and is tangent to the y -axis
- 3) center is $(-2, 4)$ and is tangent to the x -axis
- 4) center is $(-2, 4)$ and is tangent to the y -axis

5.

What is an equation of circle O shown in the graph below?



- 1) $x^2 + 10x + y^2 + 4y = -13$
- 2) $x^2 - 10x + y^2 - 4y = -13$
- 3) $x^2 + 10x + y^2 + 4y = -25$
- 4) $x^2 - 10x + y^2 - 4y = -25$

7.

What are the coordinates of the center and the length of the radius of the circle represented by the equation $x^2 + y^2 - 4x + 8y + 11 = 0$?

- 1) center $(2, -4)$ and radius 3
- 2) center $(-2, 4)$ and radius 3
- 3) center $(2, -4)$ and radius 9
- 4) center $(-2, 4)$ and radius 9