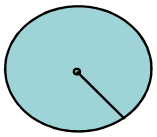
Graphing and Writing Equations of Circles

1

Standard Form of a Circle

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

Center is at (h, k)



r is the radius of the circle

2

General Form of a Circle

$$Ax^2+By^2+Cx+Dy+E=0$$

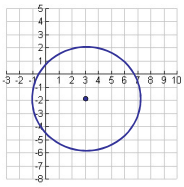
3

General Form of a Circle

- *Every binomial squared has been multiplied out.*
- *Every term is on the **left** side, equal to 0.*
- *Squared terms go first in alpha order.*

4

EX 1 Write an equation of a circle with center (3, -2) and a radius of 4.



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

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EX 2 Write an equation of a circle with center (-4, 0) and a *diameter* of 10.

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

6

EX 3 Write an equation of a circle with center (2, -9) and a *radius of* $\sqrt{11}$.

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

7

EX 4 Find the coordinates of the center and the measure of the radius.

$$(x-6)^2+(y+3)^2=25$$

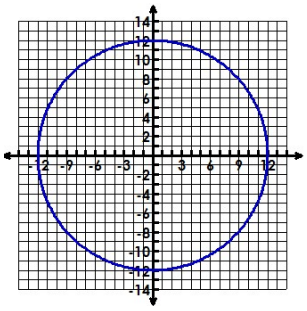
8

5. Find the center, radius, & equation of the circle.

The center is

The radius is

The equation is



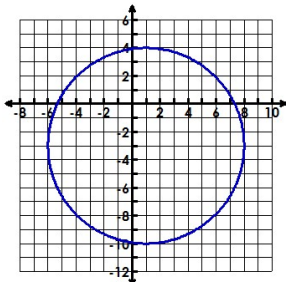
9

6. Find the center, radius, & equation of the circle.

The center is

The radius is

The equation is



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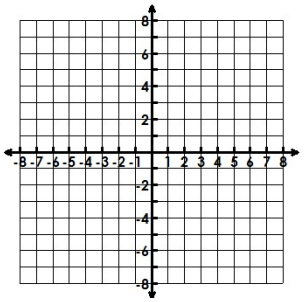
7. Graph the circle, identify the center & radius.

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

Center

Radius of



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Converting from General to Standard

1. **A needs to be 1. Divide if needed.**
2. **Move the x terms together and the y terms together.**
3. **Move E to the other side of the equals sign.**
4. **Complete the square (as needed) for x.**
5. **Complete the square(as needed) for y.**
6. **Factor the left & simplify the right.**

12

8. Write the **standard** equation of the circle.
State the center & radius.

$$x^2 + y^2 - 8x + 7 = 0$$

13

9. Write the **standard** equation of the circle.
State the center & radius.

$$x^2 + y^2 + 4x - 6y - 3 = 0$$

14

10. Write the **standard** equation of the circle.
State the center & radius.

$$2x^2 + 2y^2 - 16x + 4y + 20 = 0$$

15

11. Write the **general** form of the equation of the circle.

$$(x-4)^2 + (y+3)^2 = 36$$

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