Geometry
Equations of Circles

Name: _____
Date: _____

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

Center: (h, k)

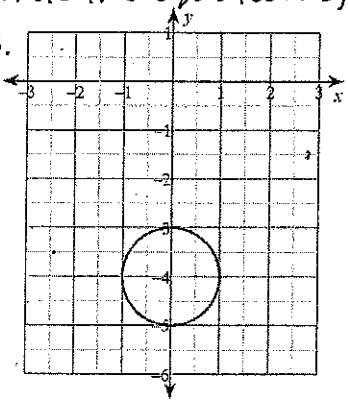
Use the following information to write the equation of the circle.

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

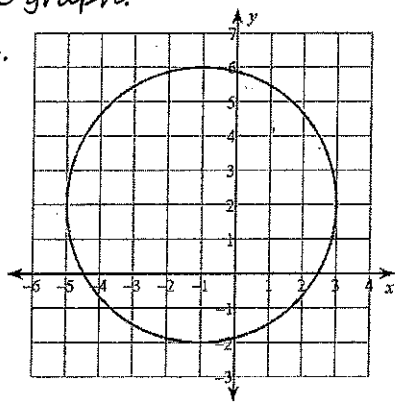
2. Center: (15, -8)
   Radius: 4

Write the equation of the circle from the graph.

3.

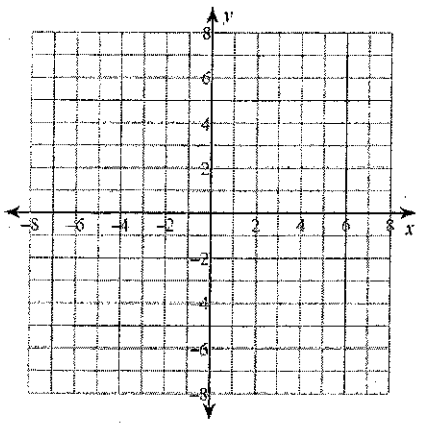


4.

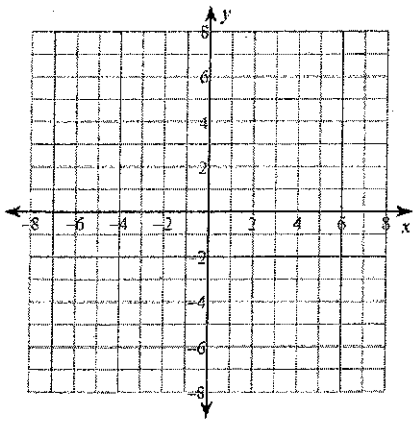


Identify the center and radius of the circle and then graph.

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:

Find the distance between two points

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

Midpoint Formula:

Find the point halfway between two points.

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Feb 25-8:00 AM

Find the radius using the distance formula and then write the equation of the circle.

3) Center: $(11, -1)$
Point on Circle: $(14, 1)$

Feb 25-8:03 AM

Find the center by using the midpoint formula. Find the radius using center and one endpoint using the distance formula. Write the equation of the circle.

7) Ends of a diameter: $(1, -17)$ and $(-1, -15)$

Feb 25-8:04 AM

Geometry
Equations of Circles

Name: Key
Date: _____

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

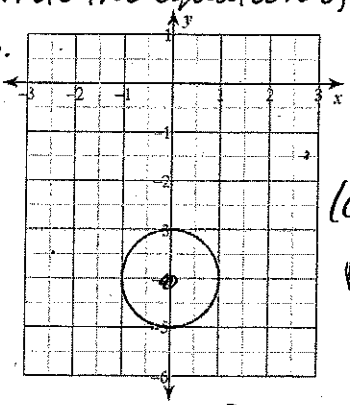
Center: (h, k)

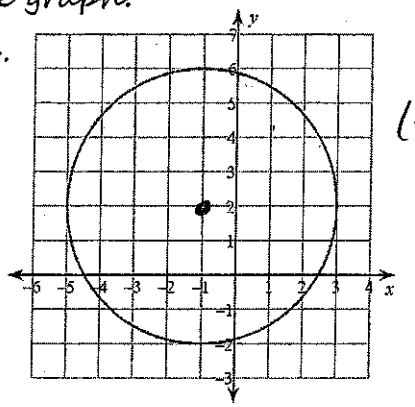
Use the following information to write the equation of the circle.

1. Center: (6, 13)
   Radius: 3
   $(x-6)^2+(y-13)^2=9$

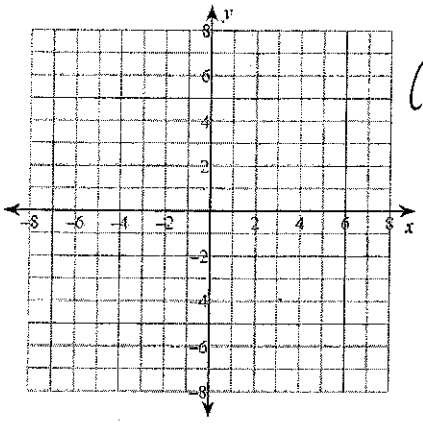
2. Center: (15, -8)
   Radius: 4
   $(x-15)^2+(y+8)^2=16$

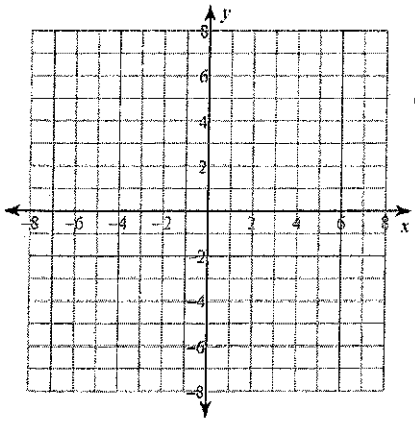
Write the equation of the circle from the graph.

3. 
   (0, -4)
   r = 1
   $x^2+(y+4)^2=1$

4. 
   (-1, 2)
   r = 4
   $(x+1)^2+(y-2)^2=16$

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

5. $(x + 2)^2 + y^2 = 25$
   
   (-2, 0)
   r = 5

6. $(x - 1)^2 + (y + 2)^2 = 16$
   
   (1, -2)
   r = 4

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

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

8. $(x + 1)^2 + (y + 1)^2 = 9$
   Point: (-2, 2)
   $(-2+1)^2+(2+1)^2=9$
   $10=9$
   outside

Distance Formula:

Find the distance between two points

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

Midpoint Formula:

Find the point halfway between two points.

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$r = \sqrt{(x-h)^2 + (y-k)^2}$$

(equation of circle)

Feb 25-8:00 AM

Find the radius using the distance formula and then write the equation of the circle.

3) Center: (11, −1)
Point on Circle: (14, 1)

$d = \sqrt{(14-11)^2 + (1+1)^2}$

$d = \sqrt{3^2 + 2^2}$

$d = \sqrt{13}$ same as radius

$(x-11)^2 + (y+1)^2 = 13$

Feb 25-8:03 AM

Find the center by using the midpoint formula. Find the radius using center and one endpoint using the distance formula. Write the equation of the circle.

7) Ends of a diameter: (1, −17) and (−1, −15) *Find Midpt

$\left(\frac{1-1}{2}, \frac{-17-15}{2}\right) = (0, -16)$

Feb 25-8:04 AM

Name _____ Class _____ Date _____

Practice 11-5

Circles in the Coordinate Plane

Find the center and radius of each circle.

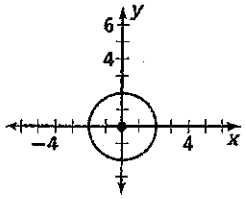
1. $x^2 + y^2 = 36$
2. $(x - 2)^2 + (y - 7)^2 = 49$
3. $(x + 1)^2 + (y + 6)^2 = 16$
4. $(x + 3)^2 + (y - 11)^2 = 12$

Write the standard equation of each circle.

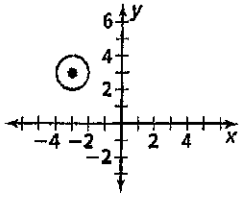
5. center $(0, 0)$; $r = 7$
6. center $(4, 3)$; $r = 8$
7. center $(5, 3)$; $r = 2$
8. center $(-5, 4)$; $r = \frac{1}{2}$
9. center $(-2, -5)$; $r = \sqrt{2}$
10. center $(-1, 6)$; $r = \sqrt{5}$

Write an equation for each circle.

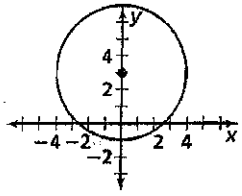
11.



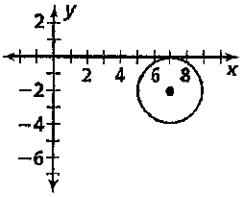
12.



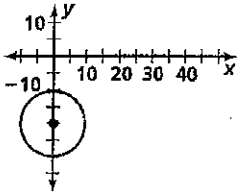
13.



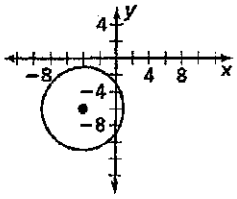
14.



15.



16.



Graph each circle. Label its center, and state its radius.

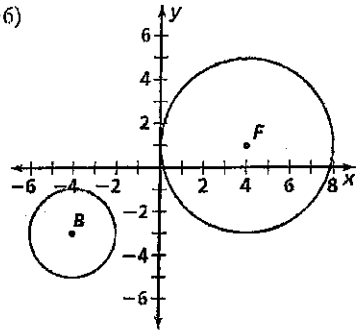
17. $x^2 + y^2 = 25$
18. $(x - 3)^2 + (y - 5)^2 = 9$
19. $(x + 2)^2 + (y + 4)^2 = 16$
20. $(x + 1)^2 + (y - 1)^2 = 36$

Write an equation for each circle with the given center that passes through the given point.

21. center $(0, 0)$; point $(3, 4)$
22. center $(5, 9)$; point $(2, 9)$
23. center $(-4, -3)$; point $(2, 2)$
24. center $(7, -2)$; point $(-1, -6)$

Write an equation that describes the position and range of each circle.

25. $\odot B$
26. $\odot F$



Key

Name _____ Class _____ Date _____

Practice 11-5

Circles in the Coordinate Plane

Find the center and radius of each circle.

1. $x^2 + y^2 = 36$ (0,0) r=6
2. $(x - 2)^2 + (y - 7)^2 = 49$ (2,7) r=7
3. $(x + 1)^2 + (y + 6)^2 = 16$ (-1,-6) r=4
4. $(x + 3)^2 + (y - 11)^2 = 12$ (-3,11) $r=\sqrt{12}$ $r=2\sqrt{3}$

Write the standard equation of each circle.

5. center $(0, 0)$; $r = 7$ $x^2+y^2=49$
6. center $(4, 3)$; $r = 8$ $(x-4)^2+(y-3)^2=64$
7. center $(5, 3)$; $r = 2$ $(x-5)^2+(y-3)^2=4$
8. center $(-5, 4)$; $r = \frac{1}{2}$ $(x+5)^2+(y-4)^2=\frac{1}{4}$
9. center $(-2, -5)$; $r = \sqrt{2}$ $(x+2)^2+(y+5)^2=2$
10. center $(-1, 6)$; $r = \sqrt{5}$ $(x+1)^2+(y-6)^2=5$

Write an equation for each circle.

11. $x^2+y^2=4$ (0,0) r=2
12. (-3,3) r=1 $(x+3)^2+(y-3)^2=1$
13. (0,3) r=4 $x^2+(y-3)^2=16$
14. (7,-2) r=2 $(x-7)^2+(y+2)^2=4$
15. (0,-40) r=10 $x^2+(y+40)^2=100$
16. (-2,-2) r=2 $(x+2)^2+(y+2)^2=4$

Graph each circle. Label its center, and state its radius.

17. $x^2 + y^2 = 25$ (0,0) r=5
18. $(x - 3)^2 + (y - 5)^2 = 9$ (3,5) r=3
19. $(x + 2)^2 + (y + 4)^2 = 16$ (-2,-4) r=4
20. $(x + 1)^2 + (y - 1)^2 = 36$ (-1,1) r=6

Write an equation for each circle with the given center that passes through the given point.

21. center $(0, 0)$; point $(3, 4)$ $x^2+y^2=25$
22. center $(5, 9)$; point $(2, 9)$ $(x-5)^2+(y-9)^2=9$
23. center $(-4, -3)$; point $(2, 2)$ $(x+4)^2+(y+3)^2=61$
24. center $(7, -2)$; point $(-1, -6)$ $(x-7)^2+(y+2)^2=80$

Write an equation that describes the position and range of each circle.

25. $\odot B$
26. $\odot F$