Algebra 2

Write your questions and thoughts here!

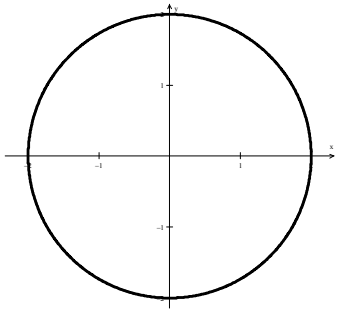
11.3 Circles

Name:_____

LABEL THE GRAPH:

center

radius



Standard Equation of a Circle

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

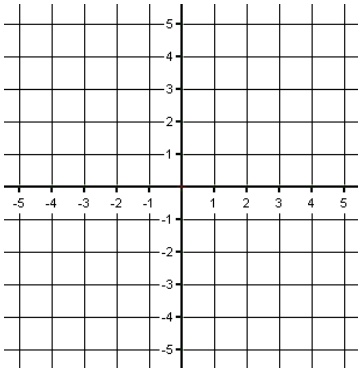
Center at (h,k) with a radius of r.

Identify the center and radius of each circle, then sketch the graph.

1. $(x+1)^2+(y-3)^2=9$

Coordinate of center:

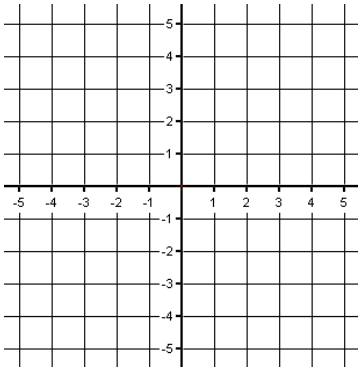
radius:



2. $x^2+(y+2)^2=16$

Coordinate of center:

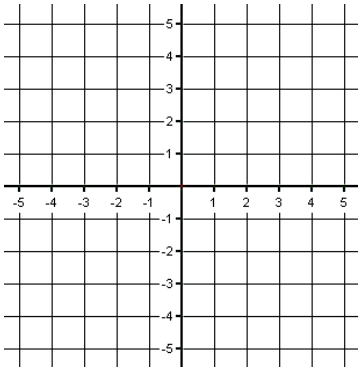
radius:



3. $(y-2)^2+(x-1)^2=7$

Coordinate of center:

radius:



11.3 Circles

Write your questions and thoughts here!

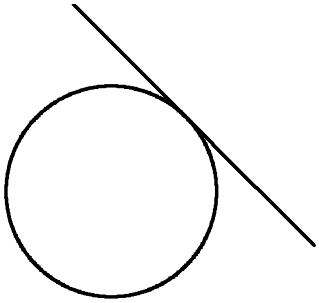
Given the center and a point on the circle, write an equation of a circle in standard form.

4. Center: $(3, -7)$
   Point on the circle: $(1, 0)$

5. Center: $(5, 0)$
   Point on the circle: $(-1, -3)$

Equation of a tangent line:

$$y - y_1 = m(x - x_1)$$

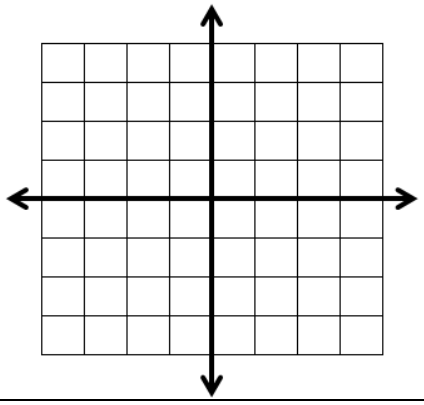


6. A circle is centered at the origin. The coordinate point $(2, 5)$ is on the circle. What is the equation of the tangent line that goes through the point $(2, 5)$?

Now summarize what you learned!

Algebra Skillz:

1. Graph $f(x) = |x + 1| + 1$



Multiply.

2. $(3 + \sqrt{5})(3 - \sqrt{5})$

3. $(2 + \sqrt{x})(3 - \sqrt{x})$

Solve by factoring.

4. $27x - 3x^3 = 0$

5. $x^4 - 6x^2 + 5 = 0$

Name_____

11.3 Practice - Circles

Period____

Use the information provided to write the standard form equation of each circle.

1) Center: $(1, -14)$
Radius: 2

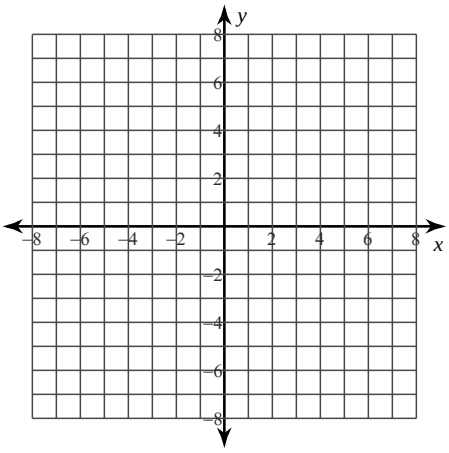
2) Center: $(14, 10)$
Radius: 2

3) Center: $(-9, -2)$
Radius: 5

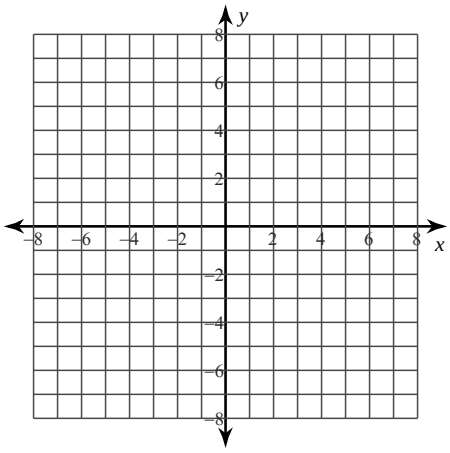
4) Center: $(9, 7)$
Radius: 6

Identify the center and radius of each. Then sketch the graph.

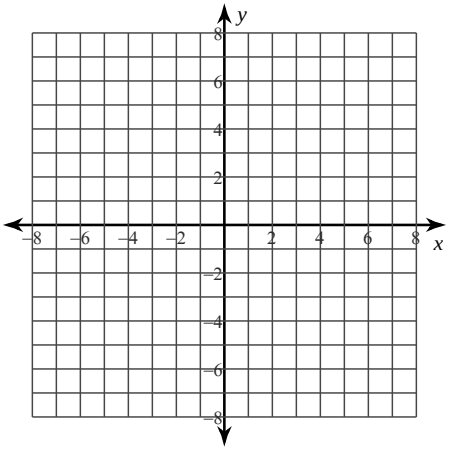
5) $(x-2)^2 + (y-3)^2 = 16$



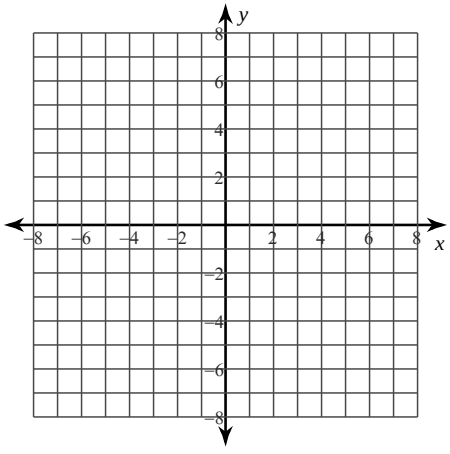
6) $(x+3)^2 + (y-2)^2 = 6$



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

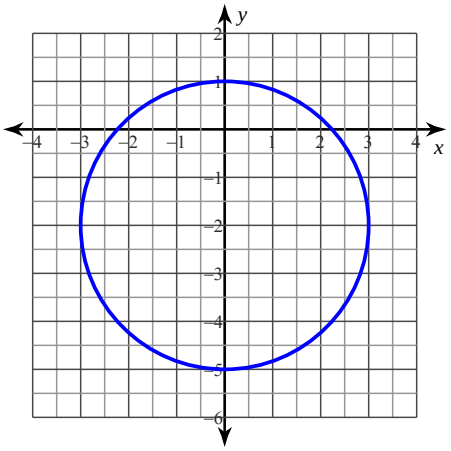


8) $(x-3)^2 + (y-1)^2 = 11$

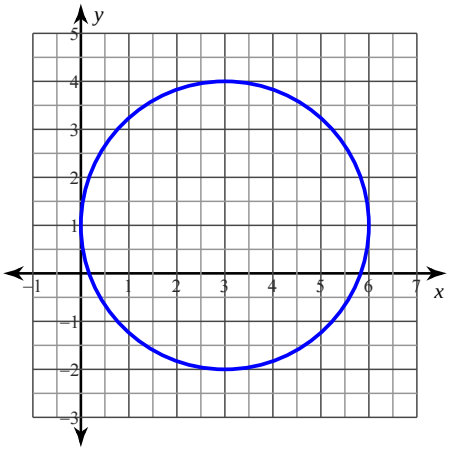


Use the information provided to write the standard form equation of each circle.

9)



10)



11) Center: $(-13, -9)$
Point on Circle: $(-13, -12)$

12) Center: $(7, 12)$
Point on Circle: $(10, 15)$

13) Center: $(12, 0)$
Point on Circle: $(5, 0)$

14) Center: $(17, -16)$
Point on Circle: $(16, -17)$

The point below is a point on a circle whose center is at the origin. Write an equation of the line tangent to the circle at the given point.

15) $(-3, 9)$

16) $(-1, -5)$

Classify the conic section as a circle or a parabola.

17) $y = (x + 2)^2 + 2$

18) $(x - 1)^2 + \left(y - \frac{7}{2}\right)^2 = 1$

19) $(x + 2)^2 + (y + 4)^2 = 1$

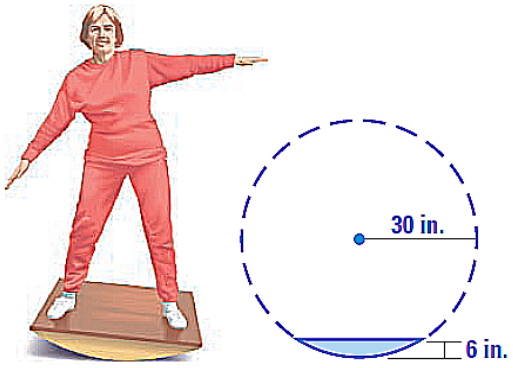
20) $x = -2(y + 6)^2 - 7$

11.3 Application and Extension

1. Suppose an earthquake can be felt up to 80 miles from its epicenter. You are located at a point 65 miles west and 50 miles south of the epicenter. Do you feel the earthquake? (To complete this problem, write the equation of a circle but write it as an **inequality.** Then check to see if you can feel the earthquake by plugging in the x and y values.)

2. A sprinkler can water a region with an 8 foot radius. A plant is 4 feet east and 6 feet north of the sprinkler. Is the plant in the sprinkler's range? (To complete this problem, write the equation of a circle but write it as an **inequality.** Then check to see if the plant gets wet by plugging in the x and y values.)

3. A tilt-board is a physical therapy device that a person rocks back and forth on. Suppose the ends of a tilt-board are part of a circle with a radius of 30 inches. If the tilt-board has a depth of 6 inches, how wide is it?



SAT Prep:

1. If the endpoints of the diameter of a circle are $(3, 10)$ and $(-1, 6)$, what are the coordinates of its center?

   (A) $(-2, -2)$ (B) $(2, 2)$

   (C) $(1, 8)$ (D) $(2, 16)$

2. The midpoint between $(x, 4)$ and $(-4,\ 6)$ is $(1,\ 5)$. What is the value of x?