Algebra 2

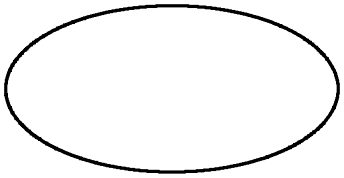
Write your questions and thoughts here!

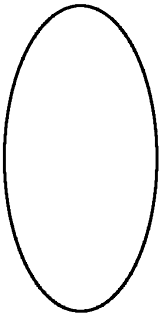
11.2 Ellipses and Circles

Name:_____

LABEL THE GRAPH:

vertex major axis co-vertex minor axis focus





Standard Equation of an Ellipse

"horizontal" ellipse: $\frac{(x-h)^2}{} + \frac{(y-k)^2}{} = 1$

"vertical" ellipse: $\frac{(x-h)^2}{} + \frac{(y-k)^2}{} = 1$

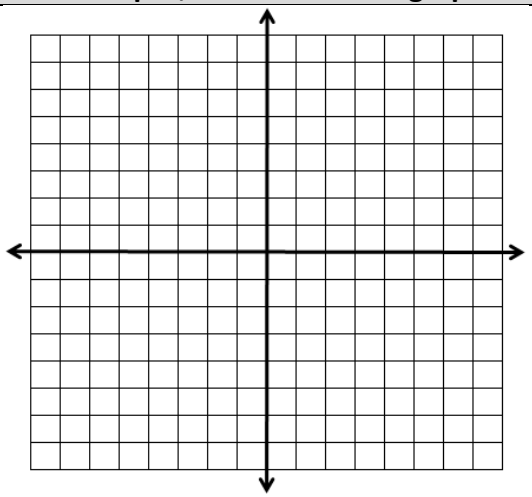
Center at (h, k)

Foci are c units away from the center on the major axis. $c^2 =$

$c =$

Identify the center, vertices, co-vertices, and foci of the ellipse, then sketch the graph

1. $\frac{(x+1)^2}{9} + \frac{(y-3)^2}{4} = 1$



center:

vertices:

co-vertices:

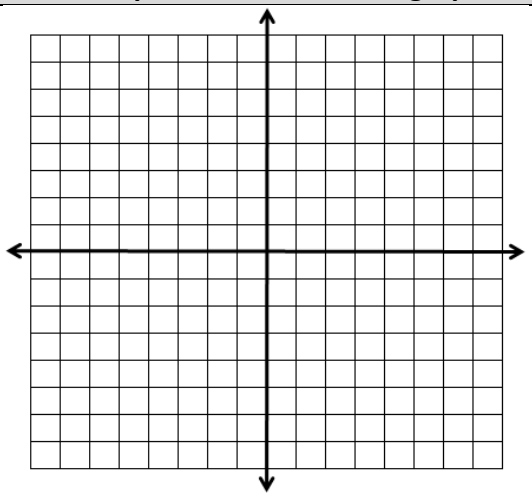
foci:

11.2 Ellipses and Circles

Write your questions and

Identify the center, vertices, co-vertices, and foci of the ellipse, then sketch the graph

2. $49(x-2)^2+25(y+1)^2=1225$



center:

vertices:

co-vertices:

foci:

Use the information provided to write the standard form equation of an ellipse.

3.
Vertices: $(20,8)$ and $(0,8)$
Co-vertices: $(10,16)$ and $(10,0)$

4.
Vertices: $(-5,9)$ and $(-5,-1)$
Foci: $(-5,7)$ and $(-5,1)$

Standard Equation of a Circle

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

11.2 Ellipses and Circles

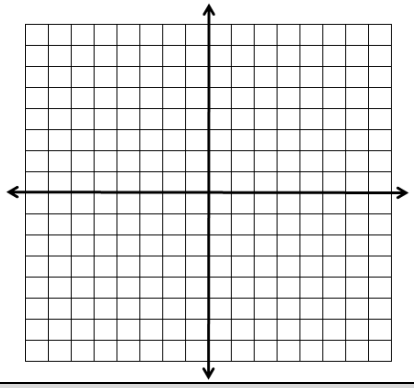
Write your questions and

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

5. $\frac{(x+1)^2}{16} + \frac{(y-3)^2}{16} = 1$

Coordinate of center:

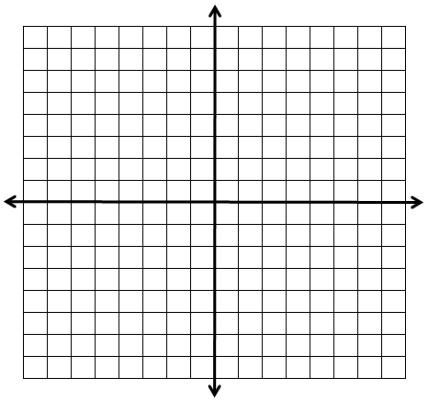
radius:



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

Coordinate of center:

radius:



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

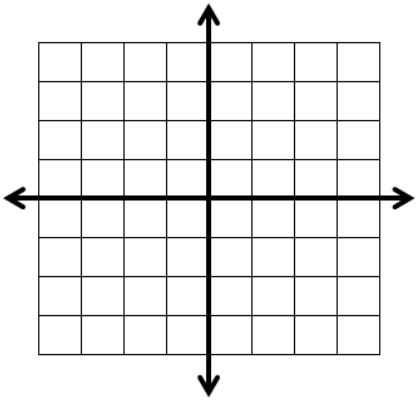
7. Center: $(3, -7)$
   Point on the circle: $(1, 0)$

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

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

Algebra 2 Name_____

11.2 Practice - Ellipses and Circles

Period____

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

1) Vertices: $(3, 19), (3, -3)$
Co-vertices: $(11, 8), (-5, 8)$

2) Vertices: $(6, 8), (-20, 8)$
Co-vertices: $(-7, 18), (-7, -2)$

3) Vertices: $(11, -4), (-9, -4)$
Co-vertices: $(1, -1), (1, -7)$

4) Vertices: $(4, 8), (4, -4)$
Co-vertices: $(7, 2), (1, 2)$

5) Vertices: $(2, 7), (-8, 7)$
Foci: $(1, 7), (-7, 7)$

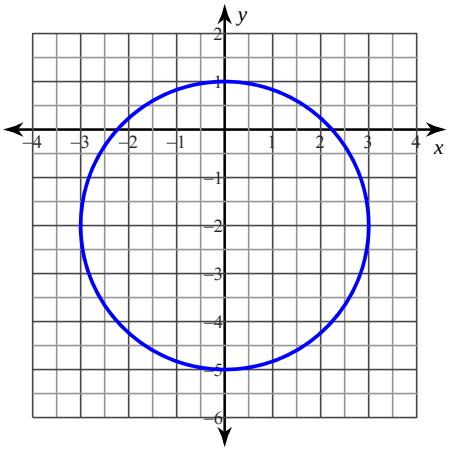
6) Vertices: $(-6, 23), (-6, -3)$
Foci: $(-6, 22), (-6, -2)$

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

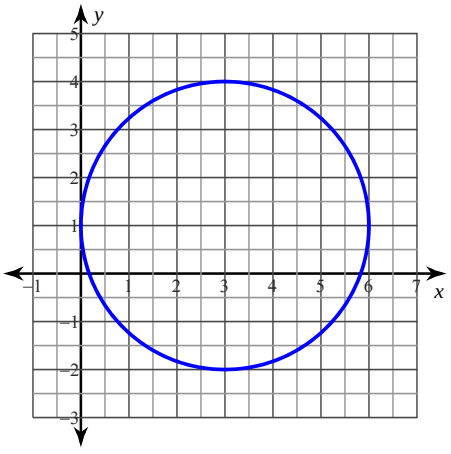
7) Center: $(-14, 15)$
Radius: 3

8) Center: $(-5, 4)$
Radius: 9

9)



10)



11) Center: $(-5, 13)$
Point on Circle: $(-11, 13)$

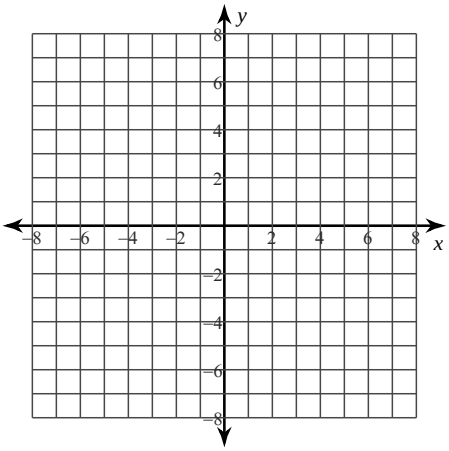
12) Center: $(12, 1)$
Point on Circle: $(5, 1)$

13) Center: $(-11, -1)$
Point on Circle: $(-13, -6)$

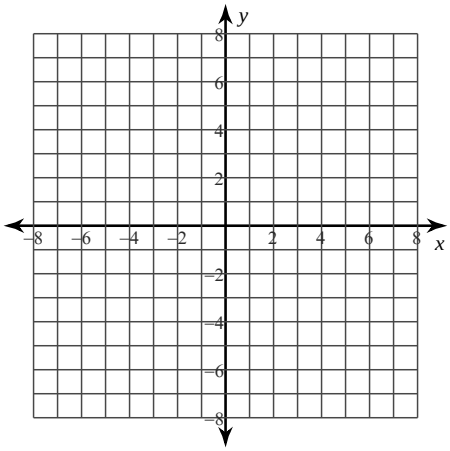
14) Center: $(7, -8)$
Point on Circle: $(6, -12)$

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

15) $(x+3)^2 + (y+3)^2 = 3$



16) $(x+2)^2 + (y+1)^2 = 25$



Classify the conic section as an ellipse, circle, or parabola.

17) $\dfrac{(x+3)^2}{16} + (y-6)^2 = 1$

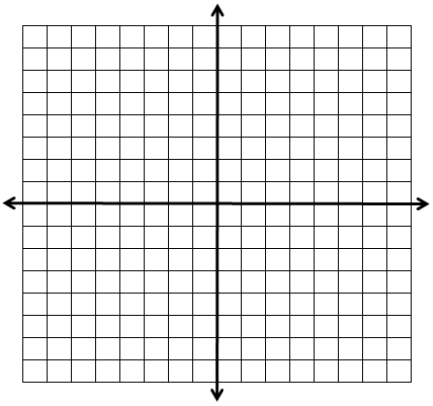
18) $(x-1)^2 + (y+1)^2 = 25$

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

20) $x^2 + (y+2)^2 = 11$

In problems 21-24, sketch the graph of the given equation and fill in the blanks for the given information.

21. $(x-5)^2+\frac{(y-1)^2}{25}=1$



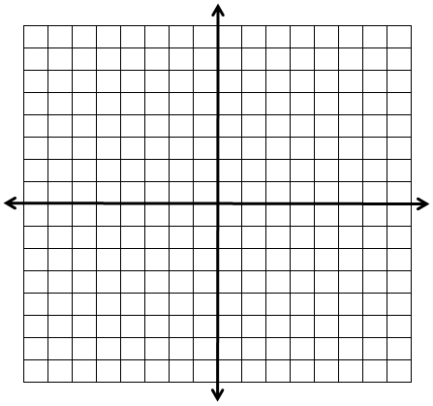
Center:

Vertices:

Co-vertices:

Foci:

22. $4(x-3)^2+16(y+1)^2=64$



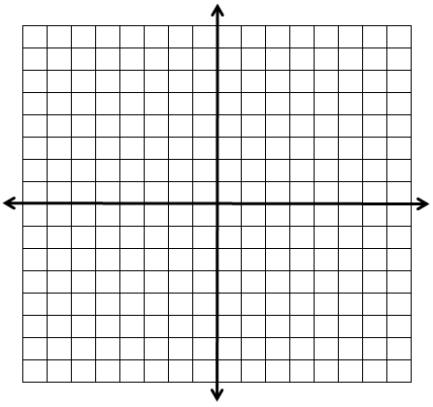
Center:

Vertices:

Co-vertices

Foci:

23. $25x^2+49(y+2)^2=1225$



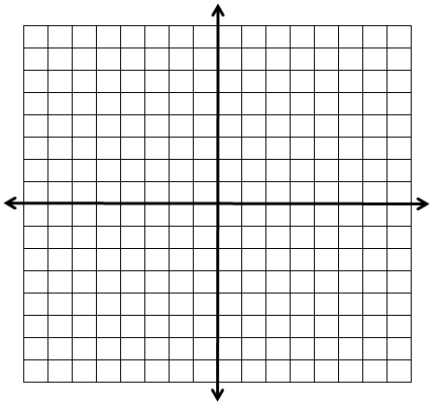
Center:

Vertices:

Co-vertices:

Foci:

24. $25(x-1)^2+9(y+2)^2=225$



Center:

Vertices:

Co-vertices

Foci:

11.2 Application and Extension

1. In 2010, Mr. Kelly visited the White House and met President Obama. While walking along the grounds, he excitedly realized that the walking path formed an ellipse. He paced it off and calculated that it was 1060 feet long and 890 feet wide. Unfortunately, the Secret Service didn't take kindly to someone measuring the grounds so he was tackled and hauled off the premises.

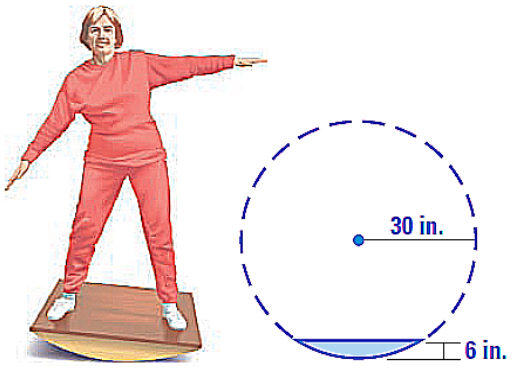
a. Write an equation of The Ellipse.

b. The area of an ellipse is $A=\pi ab$. What is the area of The Ellipse at the White House?

2. A sprinkler can water a region with an 8 foot radius.
   a. Write an ***inequality*** that represents the wet grass if the sprinkler is at the origin.

   b. A plant is 4 feet east and 6 feet north of the sprinkler. Is the plant in the sprinkler's range? (Plug in these values to your inequality.)

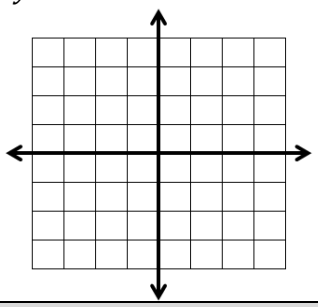
3. A tilt-board is a physical therapy device that a person rocks back and forth on. Suppose the ends of a tilt-board are part of a circle with a radius of 30 inches. If the tilt-board has a depth of 6 inches, how wide is it?



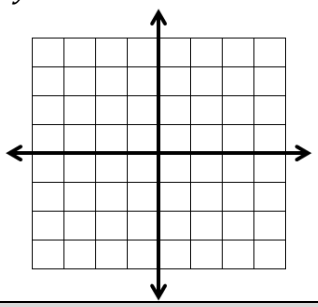
4. Given the equation: $x^2 + y^2 = 9$
   a. Solve for y.

   b. You should have two equations. List them both below, then sketch them on the graph provided. (*Hint*: Did you remember the $\pm$ in part *a*? Use a graphing calculator if you need help with the graph.)

$y =$

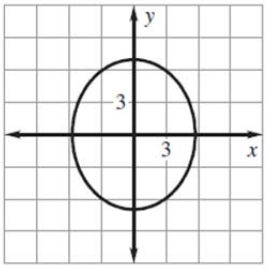


$y =$



SAT Prep:

1. Which elliptical equation is represented in the graph shown?



(A) $\frac{x^2}{49} + \frac{y^2}{33} = 1$

(B) $\frac{x^2}{33} + \frac{y^2}{49} = 1$

(C) $\frac{x^2}{7} + \frac{y^2}{4} = 1$

(D) $\frac{x^2}{4} + \frac{y^2}{7} = 1$

2. The midpoint between $(-1, -3)$ and $(3, y)$ is $(1,\ 0.5)$. What is the value of y?