

Write your questions and thoughts here!

LABEL THE GRAPH:

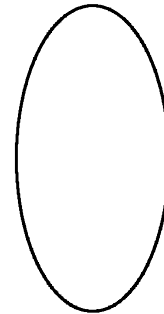
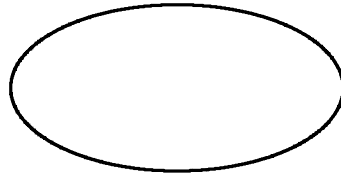
vertex

major axis

co-vertex

minor axis

focus

**Standard Equation of an Ellipse**

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

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

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

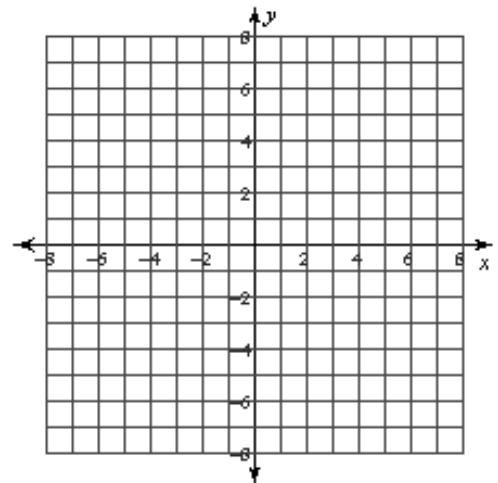
1. $\frac{(x+1)^2}{9} + \frac{(y-3)^2}{4} = 1$

center:

vertices:

co-vertices:

foci:



11.4 Ellipses

Write your questions and thoughts here!



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

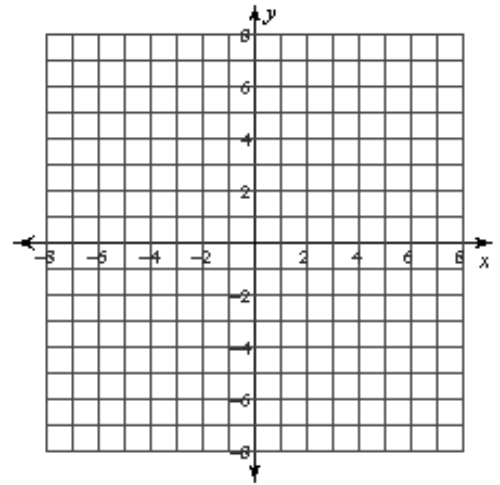
2. $49(x - 2)^2 + 25(y + 1)^2 = 1225$

center:

vertices:

co-vertices:

foci:



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

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

4.
 Vertices: (7, 19)
 (7, -3)
 Co-vertices: (13, 8)
 (1, 8)

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

Now summarize what you learned!

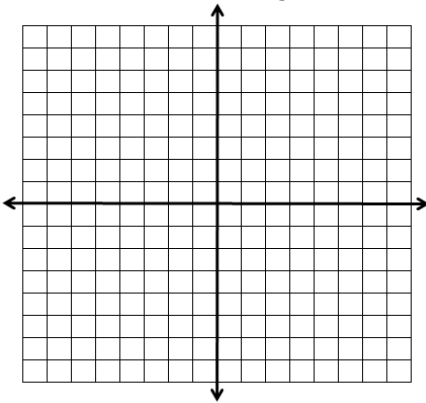
11.4 Practice – Ellipses

Name: _____

Period: _____

In problems 1-4, Sketch the graph of the given equation and fill in the blanks for the given information.

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



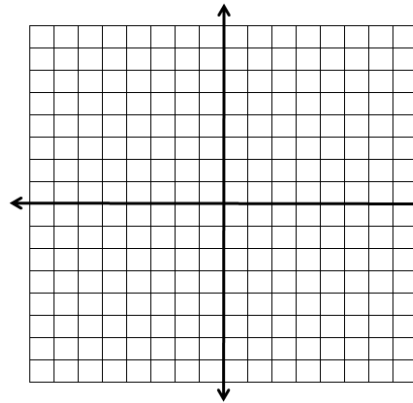
Center:

Vertices:

Co-vertices:

Foci:

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



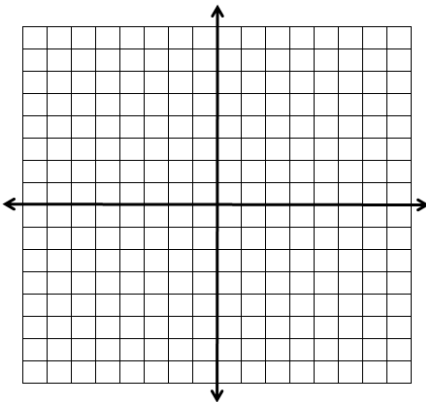
Center:

Vertices:

Co-vertices

Foci:

3. $25x^2 + 49(y + 2)^2 = 1225$



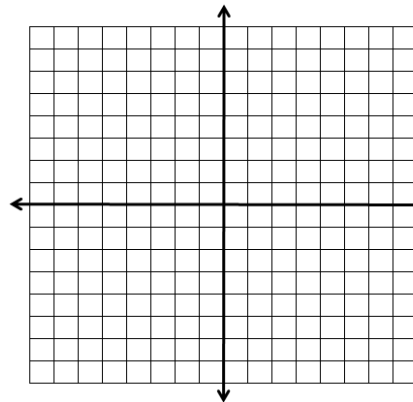
Center:

Vertices:

Co-vertices:

Foci:

4. $25(x - 1)^2 + 9(y + 2)^2 = 225$



Center:

Vertices:

Co-vertices

Foci:

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

5) Vertices: $(8, 10), (-16, 10)$
Co-vertices: $(-4, 17), (-4, 3)$

6) Vertices: $(-9, 18), (-9, 0)$
Co-vertices: $(-1, 9), (-17, 9)$

7) Vertices: $(-7, 4), (-7, -8)$
Co-vertices: $(-2, -2), (-12, -2)$

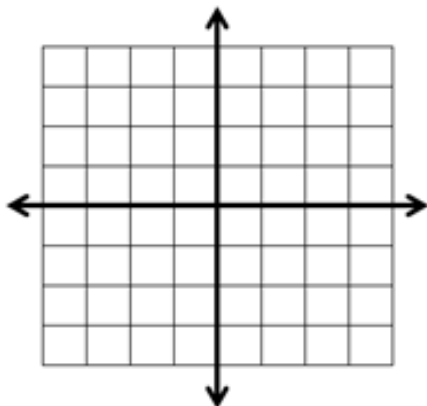
8) Vertices: $(11, -8), (-11, -8)$
Co-vertices: $(0, -2), (0, -14)$

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

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

Algebra Skills:

1. Graph $f(x) = (x - 2)^2 - 2$.



Multiply.

2. $(4 + \sqrt{7})(2 + \sqrt{7})$

3. $(1 + \sqrt{x})(2 - \sqrt{x})$

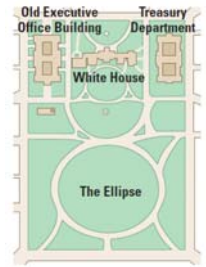
Solve by factoring.

4. $4x^3 - 16x = 0$

5. $x^4 + 4x^2 + 3 = 0$

11.4 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, and he was tackled and hauled off.



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?

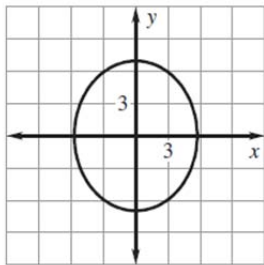
2. The Mars Global Surveyor spacecraft followed an elliptical path with the center of Mars at one focus. The spacecraft's initial orbit had a low point of 262 kilometers "above" the northern hemisphere and a high point of 52,026 kilometers "below" the southern hemisphere. **(Watch the Walkthrough for help!)**

a) The radius of Mars is approximately 5400 kilometers. If $(0, 0)$ represents the center of Mars and the positive y -axis represents north, what are the coordinates of the other focus of the orbit?

b) Write an equation for the spacecraft's initial orbit around Mars.

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 $(2, 0.5)$. What is the value of y ?

	/	/	
.	.	.	.
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9