

MATH 1650: TAKE HOME 04 - 20 POINTS

NAME: _____

DIRECTIONS: To receive full credit, make sure your work is neat and complete.

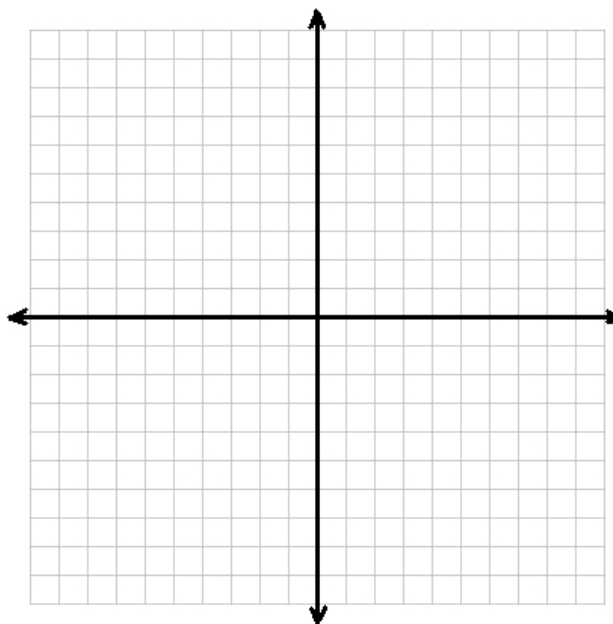
SECTION 7.2 and 7.3 PRACTICE PROBLEMS

1. Put the equation into standard form to find the center and radius and graph: $4x^2 + 4y^2 - 4x - 16y + 5 = 0$.

STANDARD FORM:

CENTER:

RADIUS:



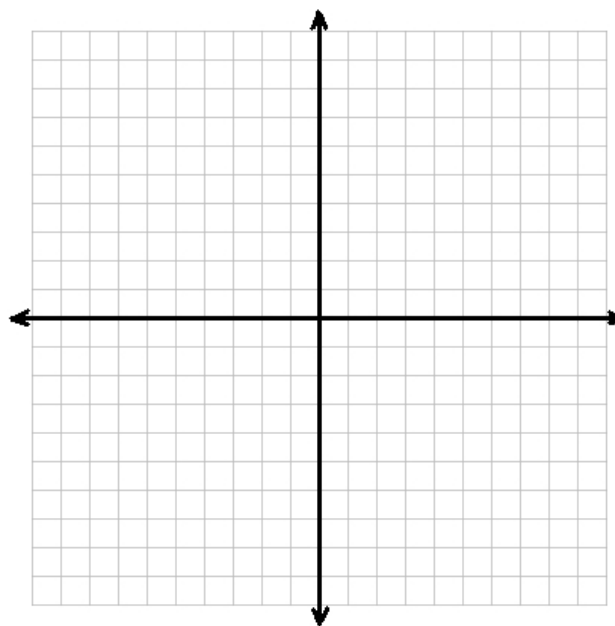
2. Find the equation of the circle which has $(-3, 2)$ and $(1, 5)$ as endpoints of a diameter.

3. Graph $f(x) = -\sqrt{10x - x^2}$ by proving the graph is part of a circle.

STANDARD FORM:

CENTER:

RADIUS:

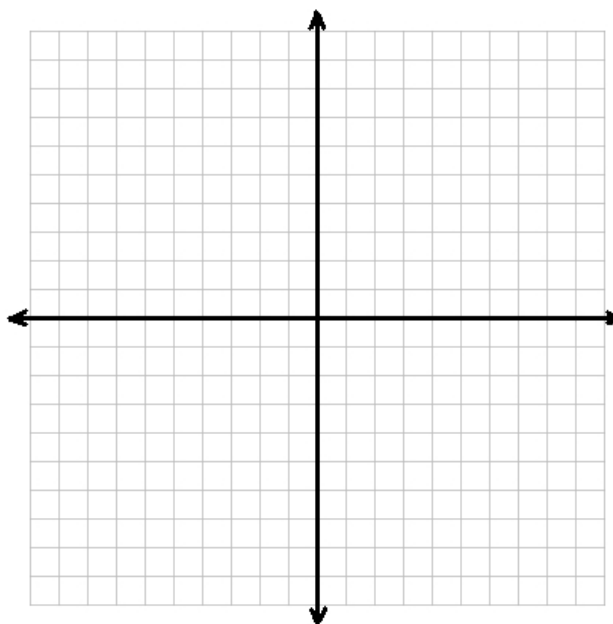


4. Put the following equation in standard form to find the vertex and focus and graph: $y^2 - 4y - 4x = 0$

STANDARD FORM:

VERTEX:

FOCUS:



5. A solar cooker is fashioned in the shape of a paraboloid of revolution. If it has a diameter of 1.00 meter and is 0.75 meters deep, what is the focal length (i.e., distance from vertex to the focus) of the cooker?



Public Domain Image taken from: <http://en.wikipedia.org/wiki/File:ALSOL.jpg>

SECTION 7.4 and 7.5 PRACTICE PROBLEMS

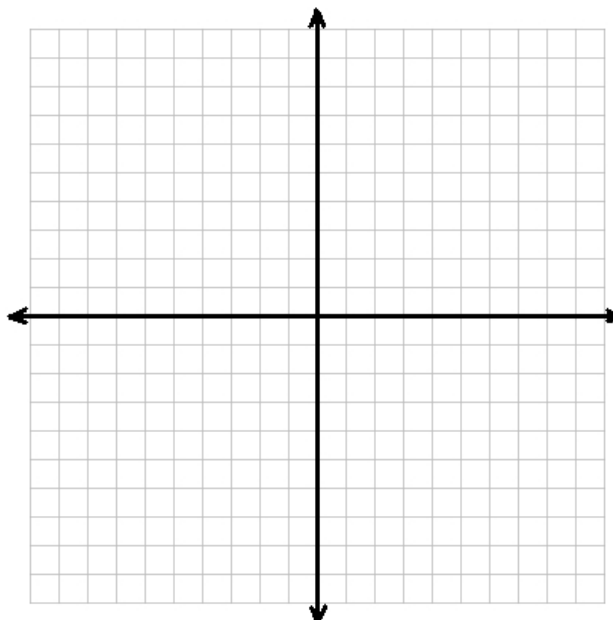
1. Put the following equation in standard form and graph: $25x^2 + 16y^2 - 100x - 300 = 0$.

STANDARD FORM:

CENTER:

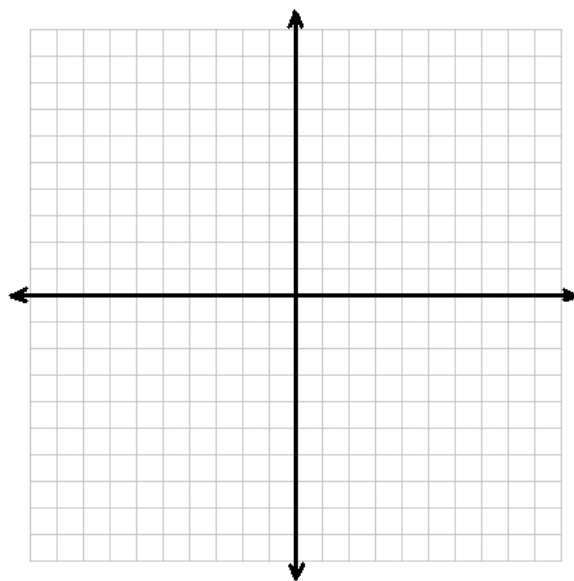
VERTICES:

FOCI:



2. Graph $f(x) = 2\sqrt{6x - x^2}$ by showing the graph is part of an ellipse.

STANDARD FORM:



3. Find the equation of the ellipse with vertices $(0, \pm 6)$ and eccentricity $e = \frac{1}{2}$.

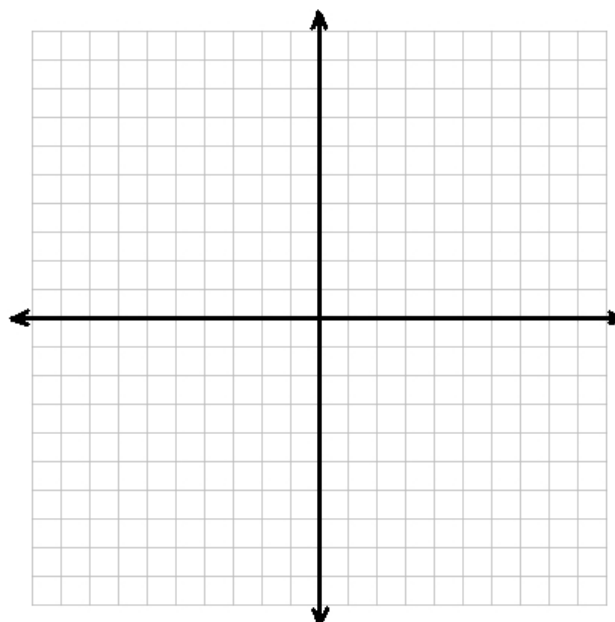
4. Put the following equation in standard form and graph: $25x^2 - 4y^2 - 16y = 116$.

STANDARD FORM:

CENTER:

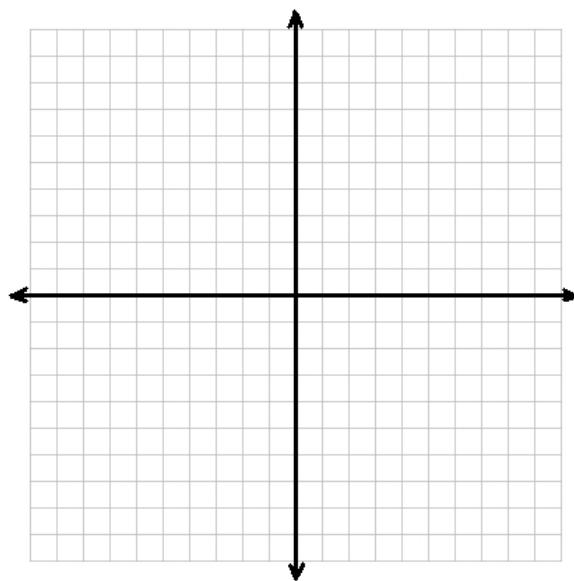
VERTICES:

ASYMPTOTES:



5. Graph $f(x) = -\sqrt{x^2 + 2x}$ by showing the graph is part of a(n) hyperbola.

STANDARD FORM:

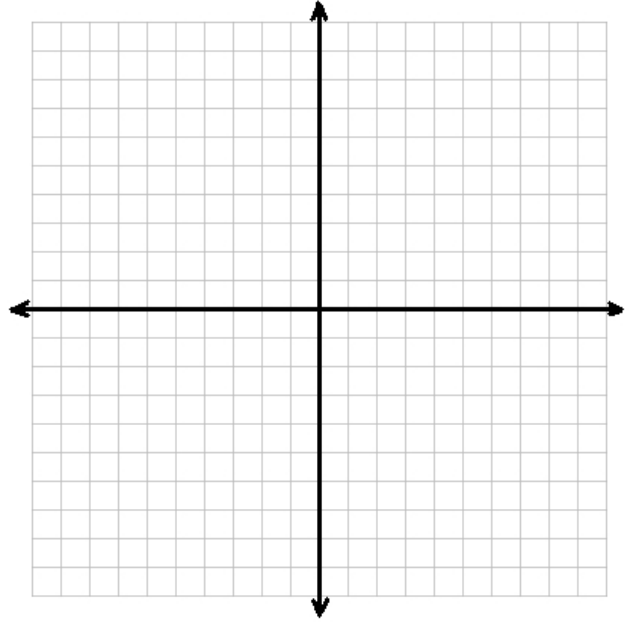


6. Find the equation of the hyperbola with vertices $(0, \pm 6)$ and asymptotes $y = \pm \frac{1}{2}x$.

SECTION 8.7 PRACTICE PROBLEMS

1. Consider the system:
$$\begin{cases} y^2 - x = 4 \\ 2x + 9y = 3 \end{cases}$$

(a) Graph both equations on the same set of axes. How many solutions do you expect for this system?



(b) Solve this system algebraically.

2. Consider the system:
$$\begin{cases} e^{2u} - \frac{1}{v} = 4 \\ \frac{2}{v} + 9e^u = 3 \end{cases}$$

(a) Use the substitution $y = e^u$ and $x = \frac{1}{v}$ to show this system has the same form as the system in #1.

(b) Use your solution from #1 to solve this system. Check your answers using desmos.

SECTION 9.1 PRACTICE PROBLEMS

1. Write out the first four terms of the following sequences.

Determine if they are arithmetic, geometric, or neither, and explain your reasoning.

- If the sequence is arithmetic, find the common difference, d .
- If the sequence is geometric, find the common ratio, r .

(a) $a_n = \frac{(-1)^{n+1} 3}{2^n}, n \geq 0.$

(b) $b_1 = 6, b_{k+1} = b_k - 2, k \geq 1.$

2. Find an explicit formula for the n th term of the sequence: $1, \frac{4}{3}, \frac{9}{5}, \frac{16}{7}, \dots$

SECTION 9.2 PRACTICE PROBLEMS

1. Write out the sum to find its value: $\sum_{n=0}^4 (-1)^n (n!)^{n+1}$

2. An ordinary annuity offers a 3% annual interest rate, compounded monthly.

(a) If \$25 is paid monthly, how much money will be in the annuity after 30 years?

Round your answer to the nearest cent.

(b) How much of the money that was earned over those 30 years interest?

SECTION 9.4 PRACTICE PROBLEMS

1. How many ways can skippy choose 3 of his 8 friends to accompany him to see the latest Superhero movie?
2. Use Pascal's Triangle to expand: $(\sqrt{x} - 3)^4$.