Conics Homework – Homework: Hyperbolas*

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Abstract

This module provides homework problems related to hyperbolas.

Exercise 1

Complete the following chart, showing the similarities and differences between ellipses and hyperbolas.

.899999999999999

	Ellipse	**Hyperbola**
How to identify an equation with this shape	Has an x^2 and a y^2 with **differentcoefficients** but the **same sign.**$3x^2 + 2y^2$ for instance.	
Equation in standard form: horizontal	$\frac{(x-h)^2}{a^2} \frac{(y-k)^2}{b^2} = 1$	
How can you tell if it is horizontal?		
Draw the shape here. Label a, b, and c on the drawing.		
Center	(h,k)	
What a represents on the graph		
What b represents on the graph		
What c represents on the graph		

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Which is the biggest, a, b, or c?		
Mathematical relationship between a, b, and c.		

Table 1

Exercise 2
$\frac{y^2}{\left(\frac{1}{4}\right)} - \frac{(x-2)^2}{9} = 1$

a. Is it horizontal or vertical?
b. What is the center?
c. What is a?
d. What is b?
e. What is c?
f. Graph it. Make sure the box and asymptotes can be clearly seen in your graph.

Exercise 3
$2x^2 + 8x - 4y^2 + 4y = 6$

a. Put in standard form.
b. Is it horizontal or vertical?
c. What is the center?
d. What is a?
e. What is b?
f. What is c?
g. Graph it. Make sure the box and asymptotes can be clearly seen in your graph.
h. What is the **equation** for one of the asymptotes that you drew?

Exercise 4
A hyperbola has vertices at the origin and (10,0). One focus is at (12,0). Find the equation for the hyperbola.

Exercise 5
A hyperbola has vertices at (1,2) and (1,22), and goes through the origin.

a. Find the equation for the hyperbola.
b. Find the coordinates of the two foci.