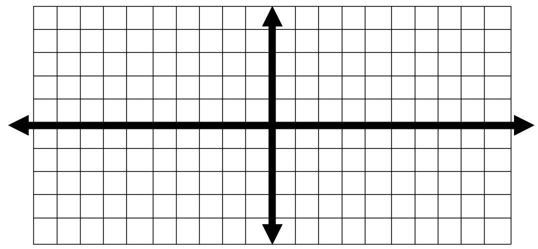
Hyperbola Exploration

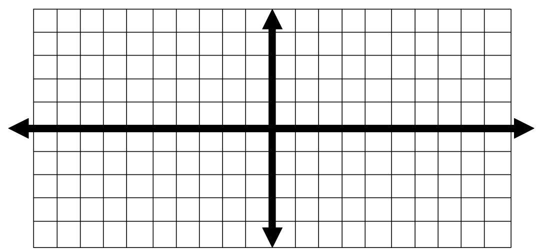
AA 2:

Solve the following for y and graph.

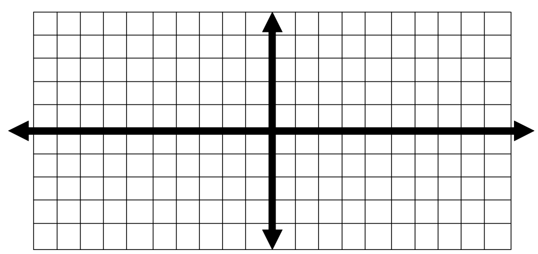
1. $\frac{x^2}{9} - \frac{y^2}{25} = 1$



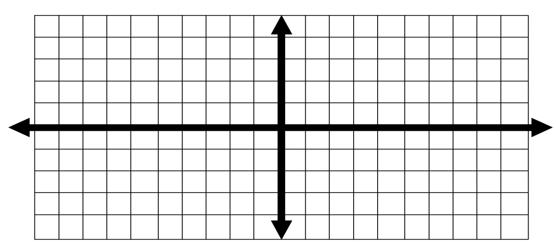
2. $\frac{y^2}{16} - \frac{x^2}{36} = 1$



3. $\frac{y^2}{4} - \frac{x^2}{1} = 1$



4. $\frac{x^2}{25} - \frac{y^2}{4} = 1$



What do the graphs have in common?

How does the hyperbola equation differ from the ellipse equation?

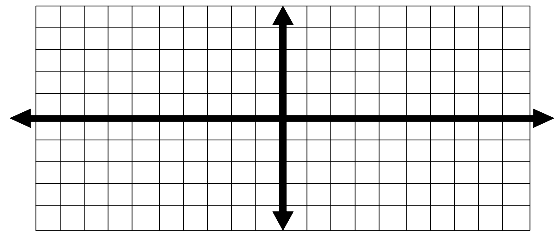
How do you know if the hyperbola will open up or down?

How do you know how far out on the axis to start the hyperbola?

The standard form of the hyperbola is: $\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$ or $\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$ centered at (h,k)

Rewrite these equations into standard form and graph. Then state the **vertices, co-vertices** of the hyperbola. The vertices are the points where the hyperbola is opening up/down or rt/lft from and the co-vertices are the points on the other edge of the "box" that help control the width of the hyperbola.

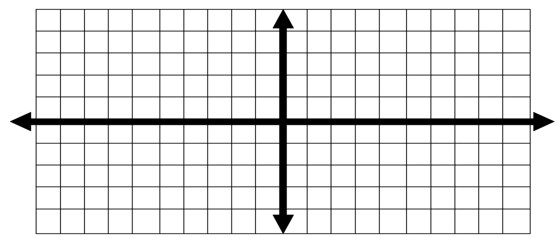
1. $100y^2 - 25x^2 = 100$



Vertices:

Co-vertices:

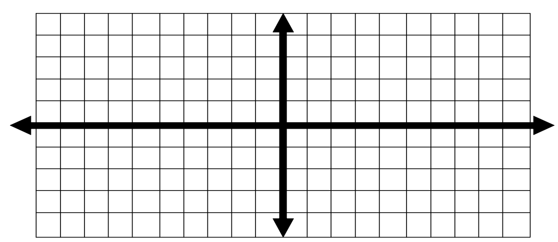
2. $x^2 - 5y^2 = 25$



Vertices:

Co-vertices:

3. $9x^2 - 25y^2 = 225$

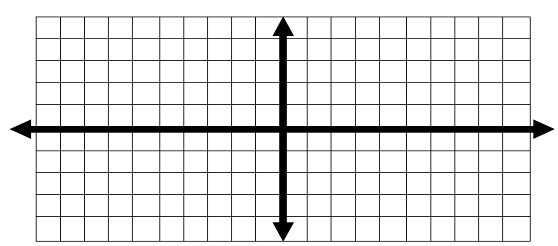


Vertices:

Co-vertices:

4. $\frac{(y-2)^2}{9} - \frac{(x+3)^2}{16} = 1$

First find the center, then graph



Center:

Vertices:

Co-vertices: