Hyperbolas – Graphing

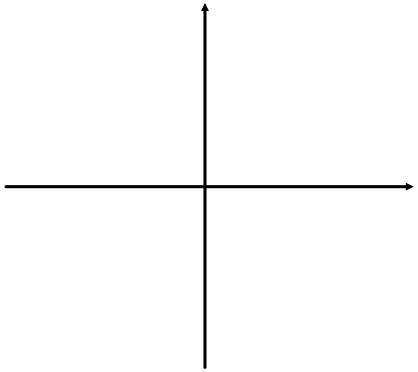
Hyperbola

A hyperbola is the set of all points (x, y) the difference of whose distances from two distinct fixed points (foci) is a positive constant.

The foci of a hyperbola lie on the transverse axis, *c* units from the center where $c^2 = a^2 + b^2$.

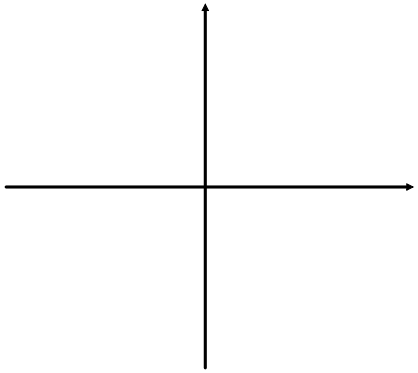
Horizontal Hyperbola

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$



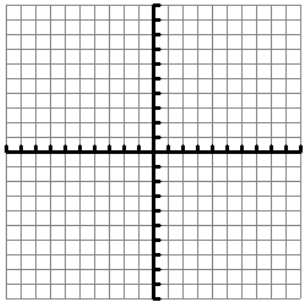
Vertical Hyperbola

$$\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$$



Example 1:

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



Center _____

Vertices _____ _____

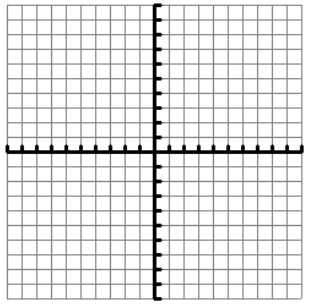
Foci _____ _____

Asymptotes = _____

Transverse axis length = _____

Example 2:

$$\frac{y^2}{4} - \frac{x^2}{9} = 1$$



Center _____

Vertices _____ _____

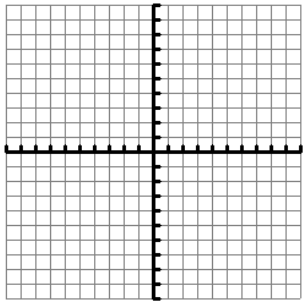
Foci _____ _____

Asymptotes = _____

Transverse axis length = _____

Example 3:

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



Center _____

Vertices _____ _____

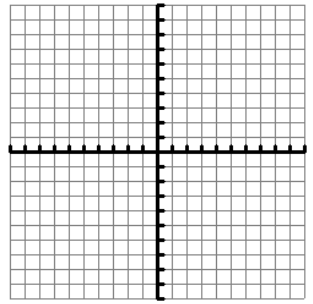
Foci _____ _____

Asymptotes = _____

Transverse axis length = _____

Example 4:

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



Center _____

Vertices _____ _____

Foci _____ _____

Asymptotes = _____

Transverse axis length = _____