

Chapter 9-4: Hyperbolas

For each equation:

- List the center of the hyperbola.
- Tell if it opens left and right or up and down.
- Determine a , b , and c for each hyperbola.
- Graph each hyperbola on graph paper. Include the foci.

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

$$\begin{aligned} a &= \frac{1}{2} \text{ of major axis} \\ b &= \frac{1}{2} \text{ of minor axis} \\ c^2 &= a^2 + b^2 \end{aligned}$$

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

3. $\left(\frac{x+1}{3}\right)^2 - \left(\frac{y-5}{6}\right)^2 = 1$

Change each equation into standard form. For each equation:

- List the center of the hyperbola.
- Tell if it opens left and right or up and down.
- Determine a , b , and c for each hyperbola.
- Graph each hyperbola on graph paper. Include the foci.

4. $4x^2 - 9y^2 + 16x + 108y - 344 = 0$

$$\begin{aligned} a &= \frac{1}{2} \text{ of major axis} \\ b &= \frac{1}{2} \text{ of minor axis} \\ c^2 &= a^2 + b^2 \end{aligned}$$

5. $x^2 - y^2 - 14x - 8y + 37 = 0$