

**Key Characteristics:**

Center

Vertices

Foci

Transverse Axis

Conjugate Axis

Asymptotes

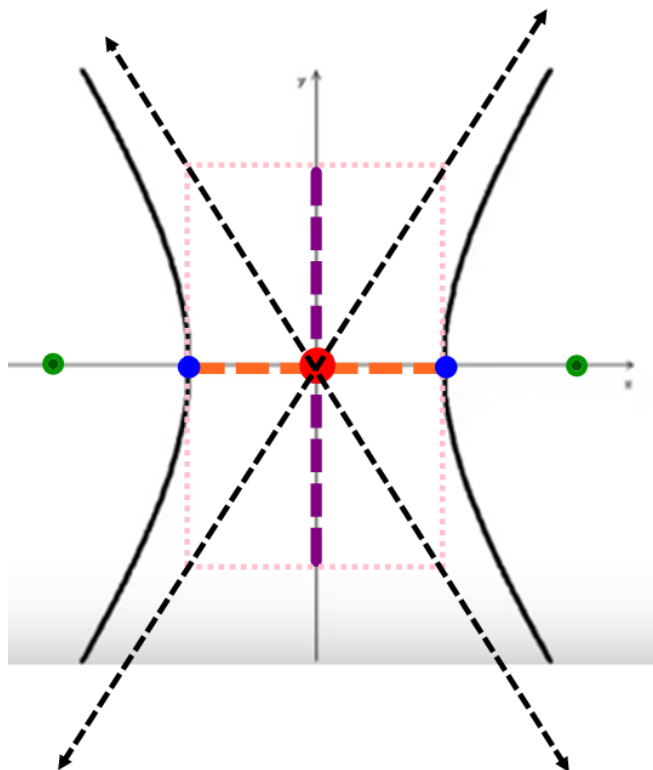


Table 9.2 Standard Forms of Equations of Hyperbolas Centered at  $(h, k)$

| Equation  | Center   | Transverse Axis                    | Vertices                     | Graph |
|---|----------|------------------------------------|------------------------------|-------|
| $\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$ <p>Vertices are <math>a</math> units right and <math>a</math> units left of center.</p> <p>Foci are <math>c</math> units right and <math>c</math> units left of center, where <math>c^2 = a^2 + b^2</math>.</p>     | $(h, k)$ | Parallel to the x-axis; horizontal | $(h - a, k)$<br>$(h + a, k)$ |       |
| $\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$ <p>Vertices are <math>a</math> units above and <math>a</math> units below the center.</p> <p>Foci are <math>c</math> units above and <math>c</math> units below the center, where <math>c^2 = a^2 + b^2</math>.</p> | $(h, k)$ | Parallel to the y-axis; vertical   | $(h, k - a)$<br>$(h, k + a)$ |       |

**Standard Equation of a Hyperbola**

**Horizontal Hyperbola**

**Vertical Hyperbola**

**Center:** \_\_\_\_\_

**Foci are  $c$  units away from the center along the transverse axis.**

**Find the indicated values and graph:**

1.)

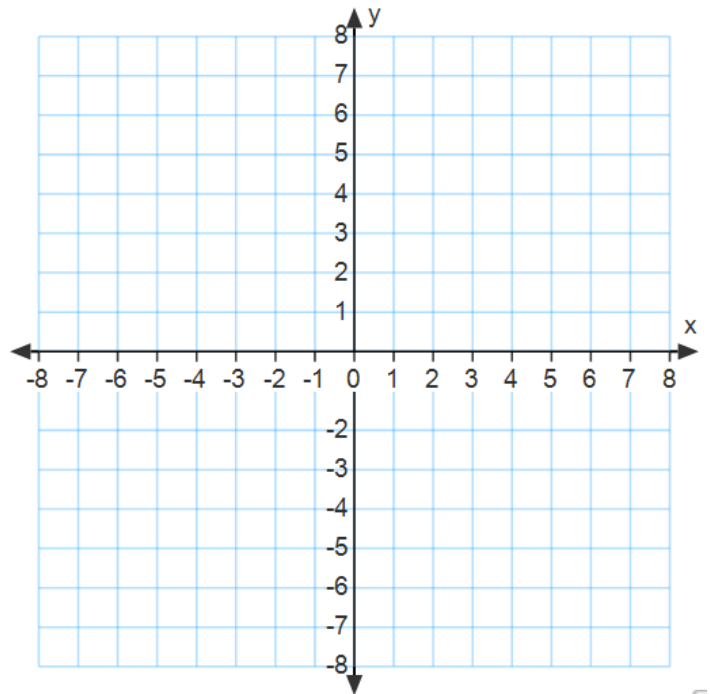
Center:

Lines Containing Axes:

Vertices:

Foci:

Equations of Asymptotes:



**Find the indicated values and graph:**

2.)

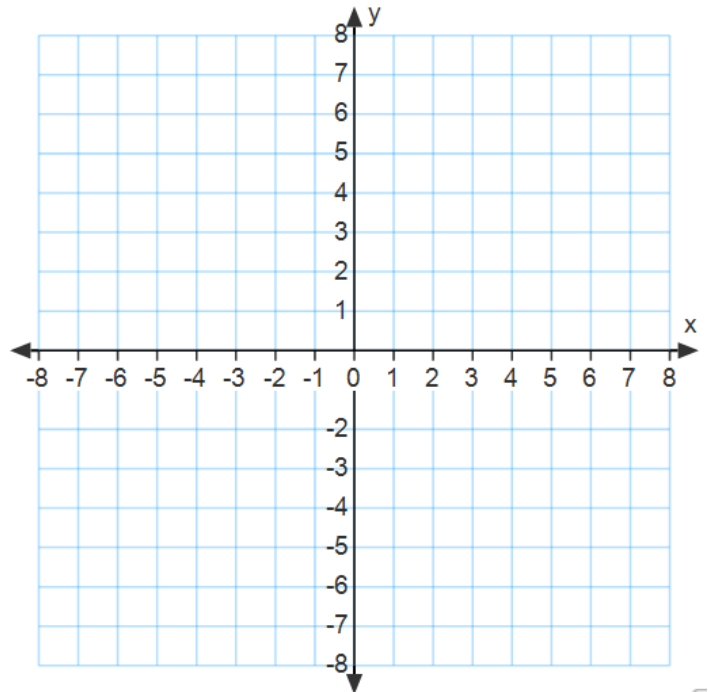
Center:

Lines Containing Axes:

Vertices:

Foci:

Equations of Asymptotes:



**Write the standard form of the hyperbola, then find the indicated values and graph.**

3.)

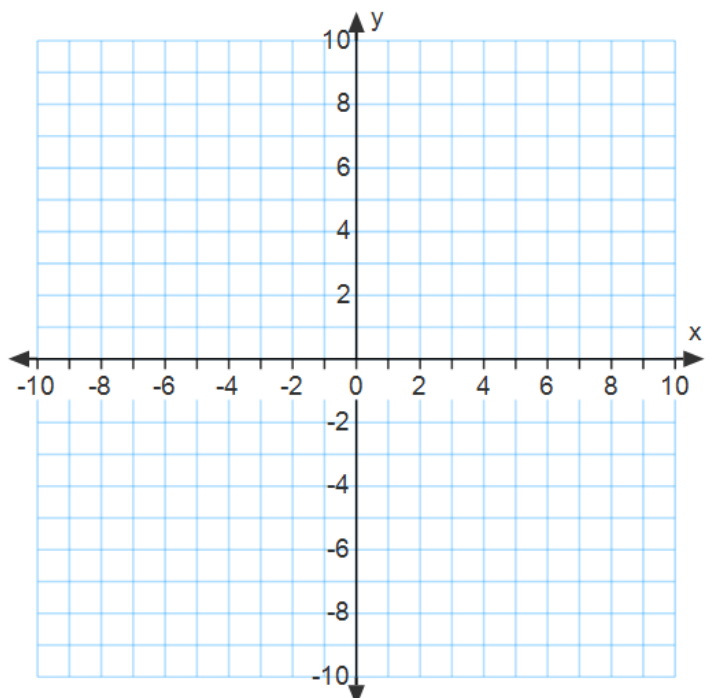
Center:

Lines Containing Axes:

Vertices:

Foci:

Equations of Asymptotes:



**Write the standard form of the hyperbola, then find the indicated values and graph.**

4.)

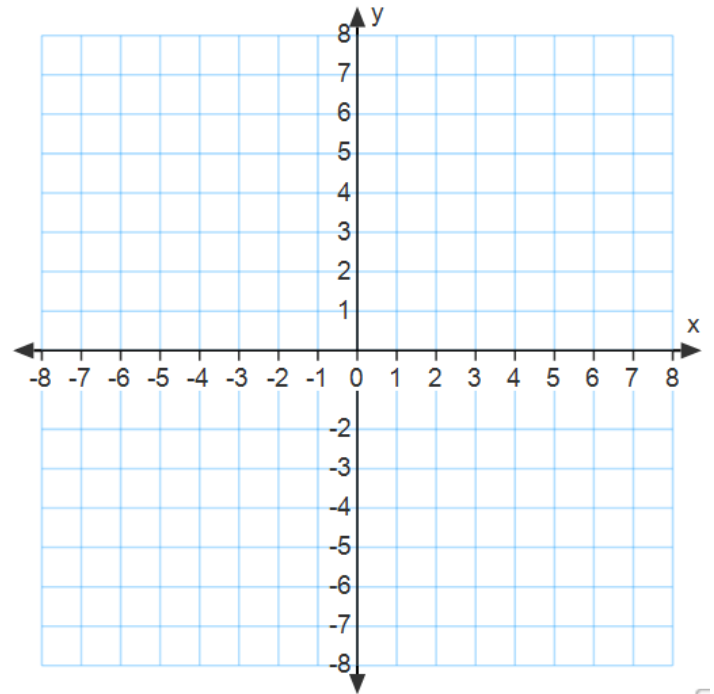
Center:

Lines Containing Axes:

Vertices:

Foci:

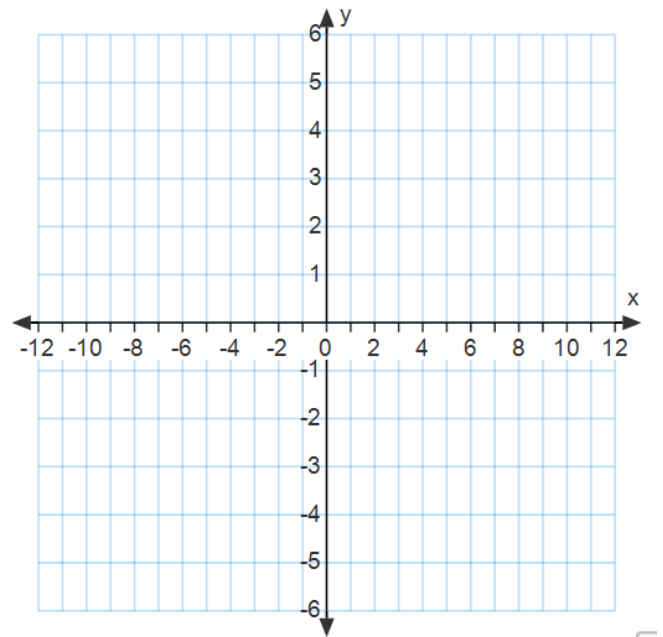
Equations of Asymptotes:



**Write the standard form of the hyperbola.**

5.) Vertices: \_\_\_\_\_

Foci: \_\_\_\_\_

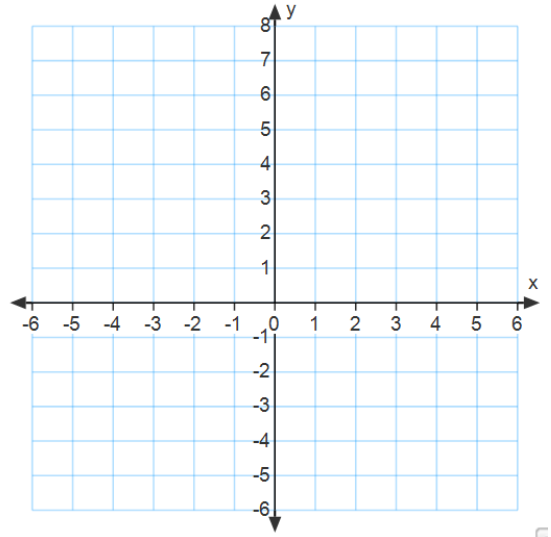


**Write the standard form of the hyperbola.**

6.) Center: \_\_\_\_\_

Vertex: \_\_\_\_\_

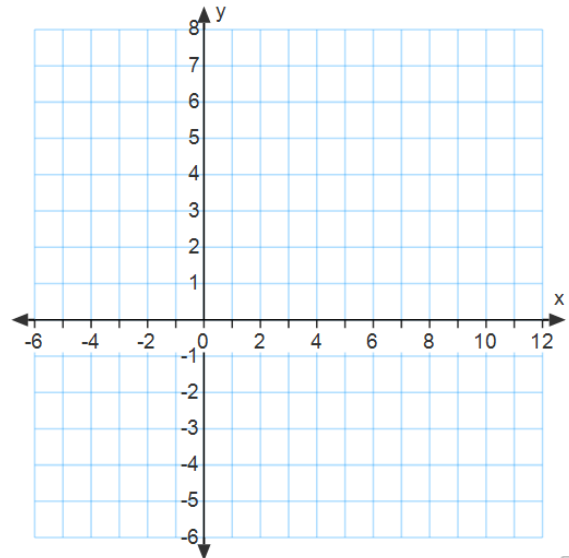
Focus: \_\_\_\_\_



7.) Vertex: \_\_\_\_\_

Vertex: \_\_\_\_\_

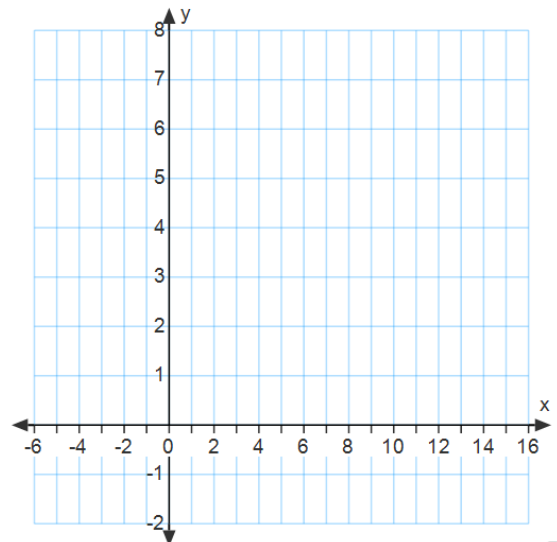
Focus: \_\_\_\_\_



8.) Vertices: \_\_\_\_\_

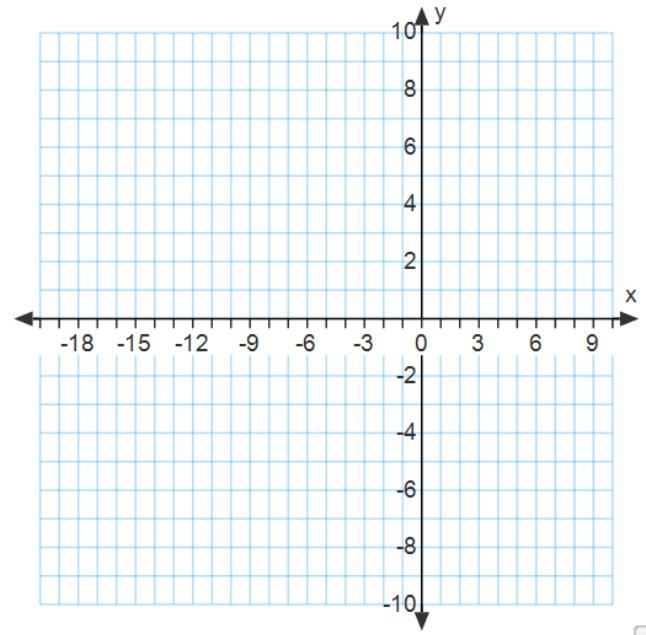
Endpoints of Conjugate Axis:

\_\_\_\_\_

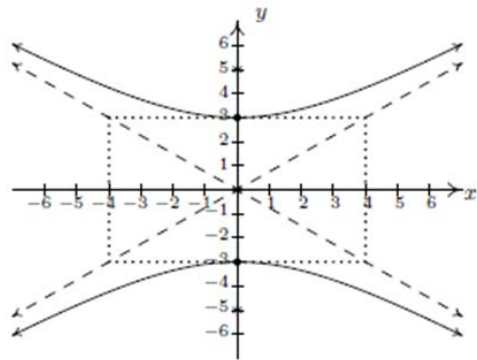


9.) Vertices: \_\_\_\_\_

Asymptotes:  
\_\_\_\_\_



10.)



11.)

