

Identify each equation as a hyperbola or ellipse. Then complete the square to find the standard form of the equation.

1.) $4x^2 + y^2 + 24x - 36y + 36 = 0$

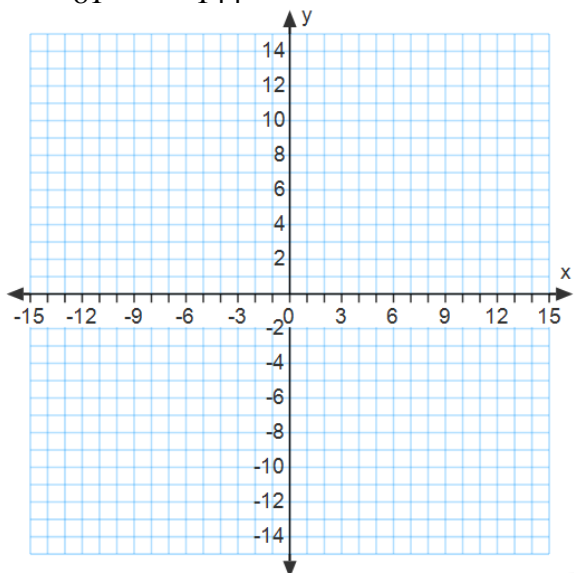
2.) $4x^2 - 25y^2 - 8x - 100y - 196 = 0$

3.) $x^2 + 16y^2 - 10x + 96y + 153 = 0$

4.) $25x^2 - 9y^2 + 200x + 18y + 166 = 0$

Find the center, vertices, co-vertices, and foci. Then graph the ellipse.

5.) $\frac{(x+5)^2}{81} + \frac{(y-1)^2}{144} = 1$



Center:

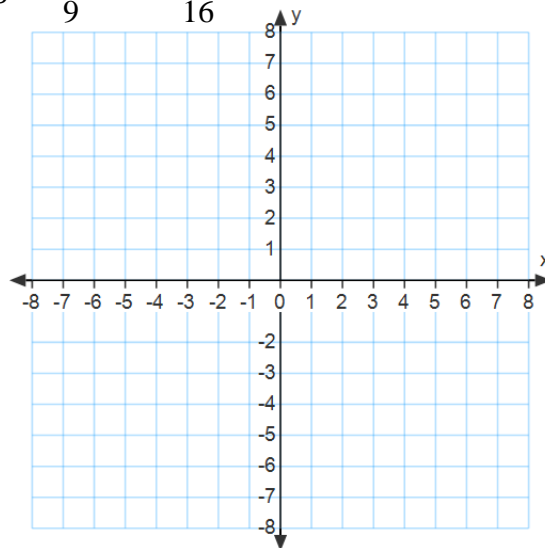
Vertices:

Co-Vertices:

Foci:

Graph the hyperbola and find the indicated values.

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



Center:

Vertices:

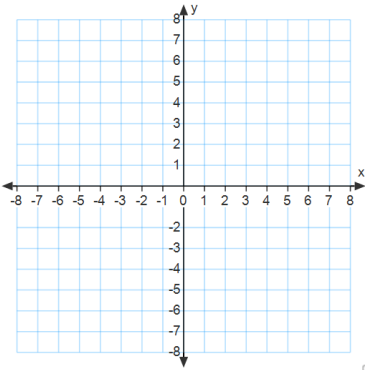
Lines Containing Axes:

Foci:

Equations of Asymptotes:

Given the equation of the ellipse or hyperbola, find the center, foci and vertices.

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



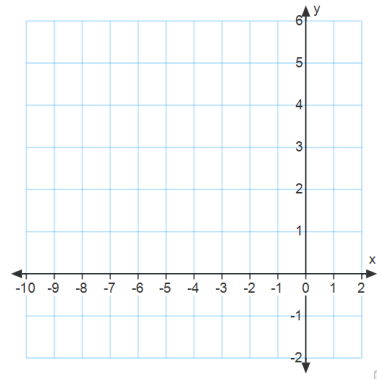
Conic: _____

Center: _____

Foci: _____

Vertices: _____

8.) $\frac{(x+5)^2}{16} + \frac{(y-4)^2}{1} = 1$



Conic: _____

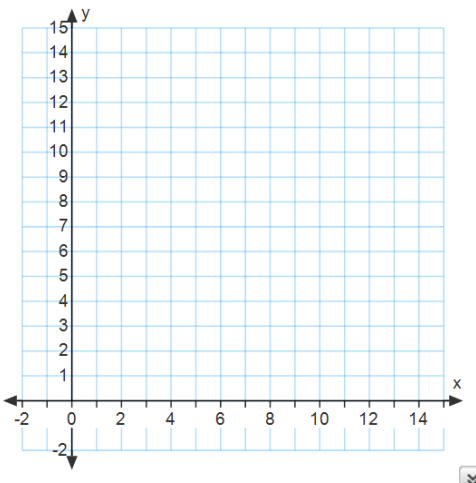
Center: _____

Foci: _____

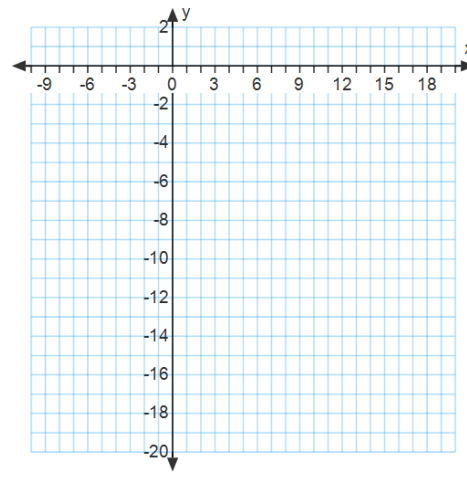
Vertices: _____

Use the information to write the equation of the ellipse in standard form.

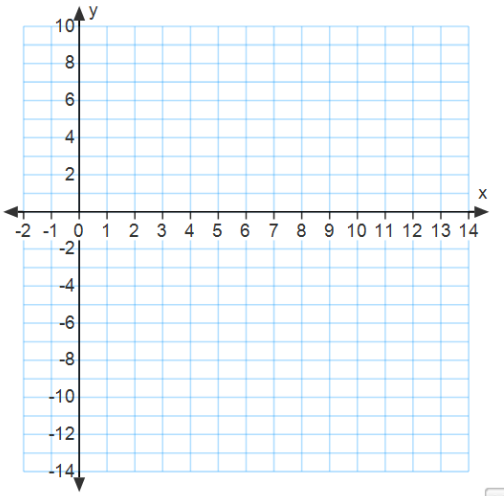
9.) Foci: (7, 9) and (-1, 9)
Co-vertices: (3, 12) and (3, 6)



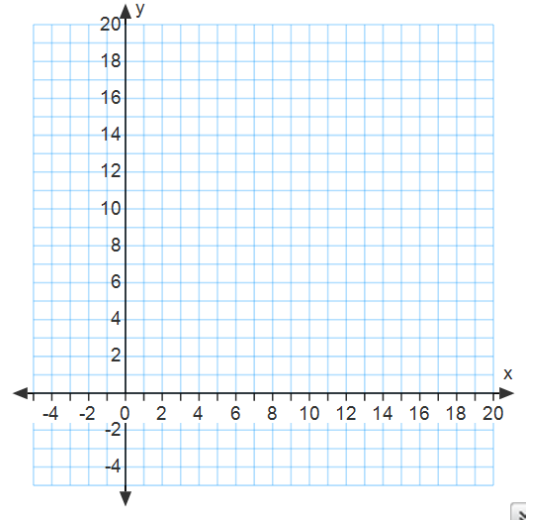
10.) Center: (7, -10)
Vertex: (-6, -10) Co-Vertex: (7, -17)



11.) Major Axis is vertical
 Center: (8, -2)
 Major Axis: 18 units
 Minor Axis: 8 units

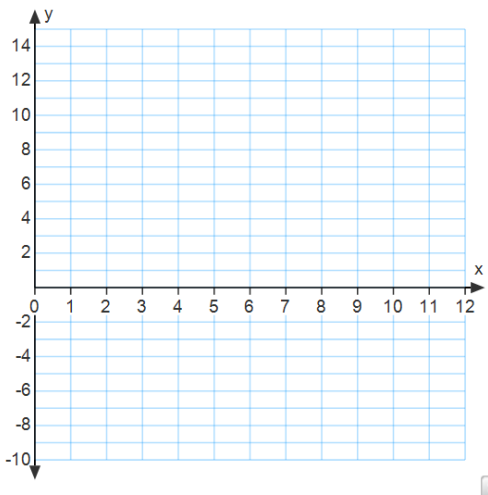


12.) Endpoints of Major Axis: (4, 18) and (4, -4)
 Endpoints of Minor Axis: (12, 7) and (-4, 7)

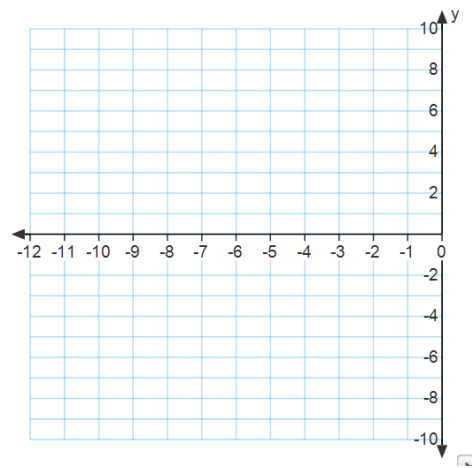


Use the information to write the equation of the hyperbola in standard form.

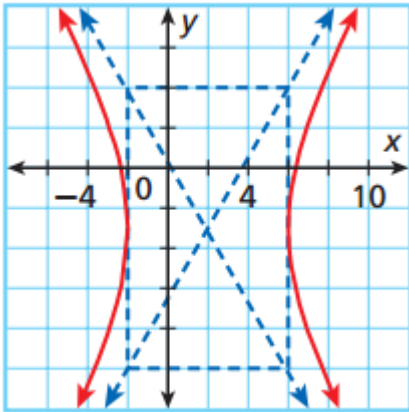
13.) Vertices: (8, 14) and (8, -10)
 Conjugate Axis: 6 units



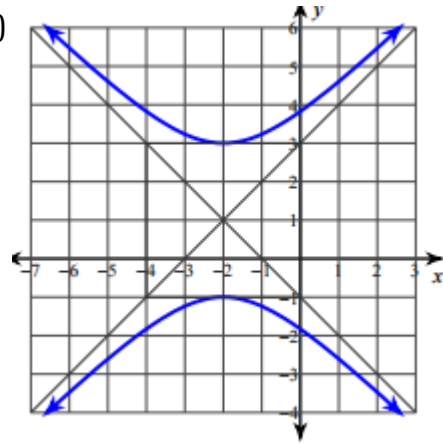
14.) Asymptotes: $y - 2 = \pm \frac{7}{5}(x + 7)$
 Transverse Axis: 10 units



15.)



16.)



17.) A semielliptical arch supports a bridge that spans a river 20 yards wide. The center of the arch is 6 yards above the river's center. Write an equation for the ellipse so that the x-axis coincides with the water level and the y-axis passes through the center of the arch.

