

Name: \_\_\_\_\_

**Eclipse the Hyperbole REVIEW!**

1.)  $\frac{(x+1)^2}{49} + \frac{(y+3)^2}{25} = 1$

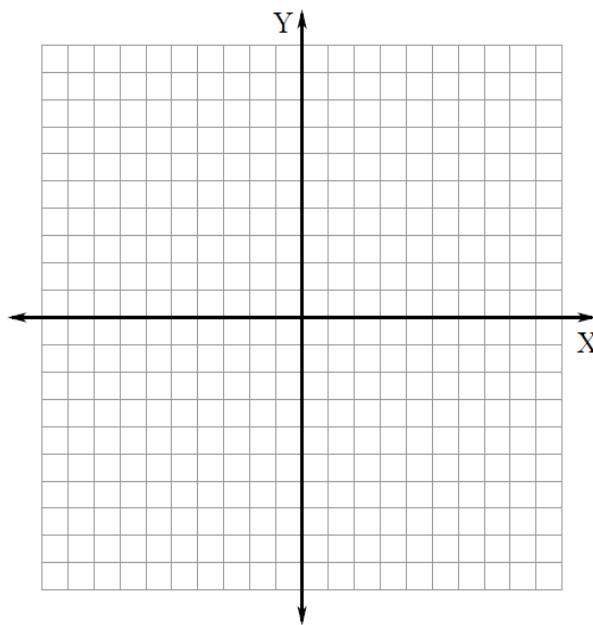
center: (      ,      )

foci: (      ,      ) & (      ,      )

major axis length: \_\_\_\_\_

minor axis length: \_\_\_\_\_

Orientation: \_\_\_\_\_



2.)  $9x^2 + 4y^2 + 36x + 24y - 72 = 0$

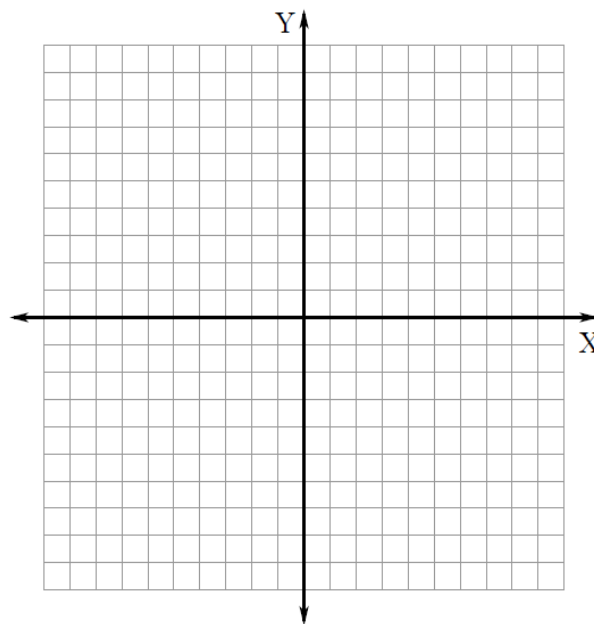
center: (      ,      )

foci: (      ,      ) & (      ,      )

major axis length: \_\_\_\_\_

minor axis length: \_\_\_\_\_

Orientation: \_\_\_\_\_



**Write the equation for the ellipse described.**

3.) The center has coordinates of (-3, 1). The major axis is parallel to the x-axis with a length of 14. The minor axis has a length of 10.

4.) The endpoints of the major axis are (14,3) and (2,3). The endpoints of the minor axis are (8,7) and (8,-1).

[Hint: make a sketch if confused. You need center and distances from center in x & y directions. ]

**Hyperbolas—identify the following features and then graph the hyperbola.**

5.)  $\frac{x^2}{9} - \frac{y^2}{36} = 1$

6.)  $\frac{(y-4)^2}{25} - \frac{(x-5)^2}{9} = 1$

center: (      ,      )

vertices: (      ,      ) & (      ,      )

foci: (      ,      ) & (      ,      )

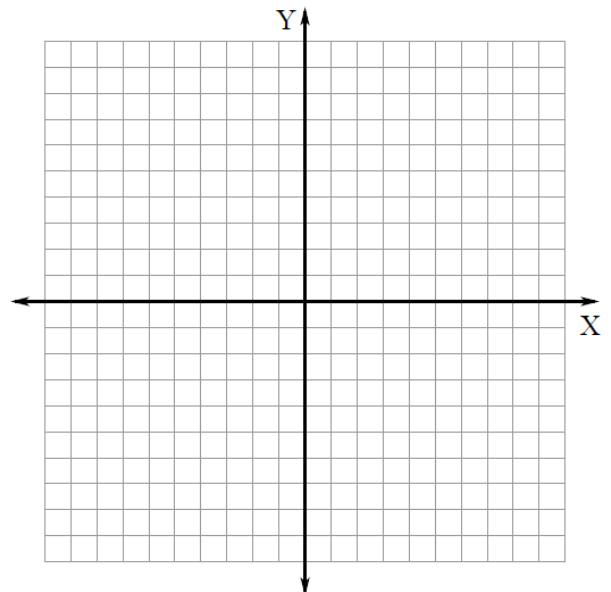
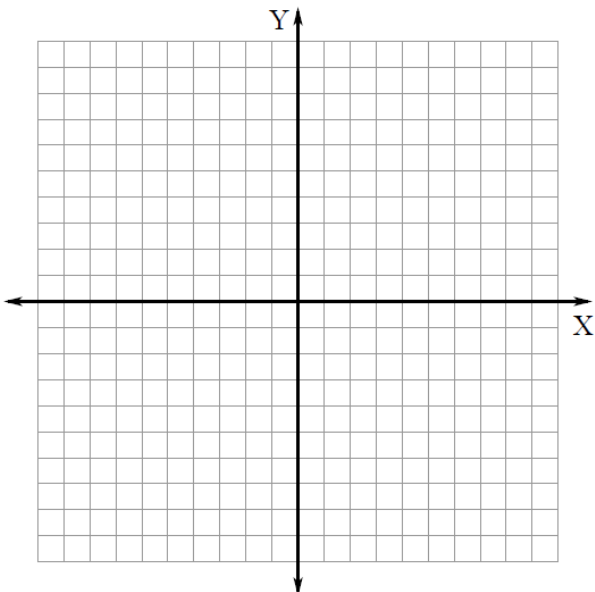
slope of asymptotes: +/-

center: (      ,      )

vertices: (      ,      ) & (      ,      )

foci: (      ,      ) & (      ,      )

slope of asymptotes: +/-



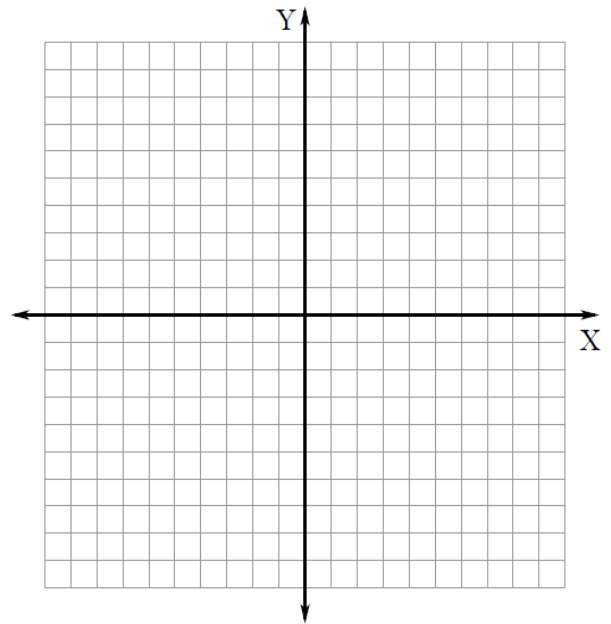
7.)  $25y^2 - 36x^2 - 50y - 72x - 911 = 0$

center: (     ,     )

vertices: (     ,     ) & (     ,     )

foci: (     ,     ) & (     ,     )

slope of asymptotes: +/-



**Write an equation for the hyperbola described.**

8.) The center is at (3, 1) with a horizontal orientation. The value of "a" is 6 and "b" is 4.

9.) The vertices are (0,4) and (0,-4). And the foci are (0,5) and (0,-5). [Hint: Use  $c^2 = a^2 + b^2$  to find  $b^2$ ]

### Applications

10.) A satellite travels in an hyperbolic orbit. It reaches the vertex of its orbit at  $(5, 0)$  and then travels along a path that gets closer and closer to the line  $y = \frac{2}{5}x$ . Write an equation that describes the path of the satellite if the center of its hyperbolic orbit is at  $(0, 0)$ .

11.) An ice skater traces two congruent ellipses to form a figure eight. Assume that the center of the first loop is at the origin, with the second loop to its right. The first loop's major axis (along the  $x$ -axis) is 12 feet long and its minor axis is 6 feet long. Write an equation to model the second loop.

12.) Brittany and Kirk were talking on the phone when Brittany heard the thunder from a lightning bolt outside. ten seconds later, she could hear the same thunder over the phone. Brittany and Kirk live 6 miles apart and sounds travels about 1 mile every 5 seconds. On a coordinate plane, assume that Brittany is located at  $(-3, 0)$  and Kirk is located at  $(3, 0)$ . Write the equation of a hyperbola that represents possible locations of the lightning strike.