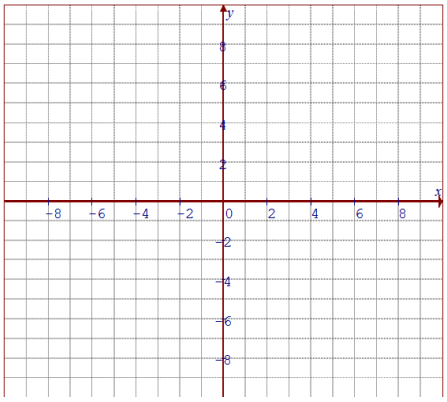
Name:_____ Date:_____

Math 10/11 Enriched: Section 7.3 Graphing Hyperbolas

1. Given each equation below, graph it on the grid provided:

a) $x^2 - y^2 = 36$

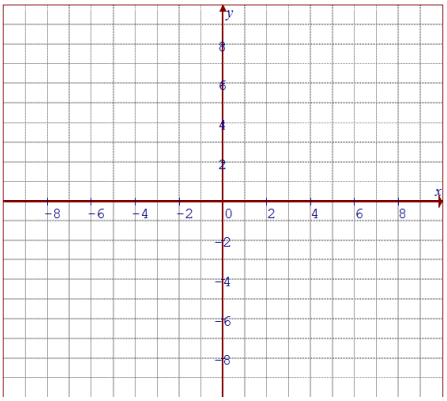


Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

b) $(x+2)^2 + (y+2)^2 = -25$

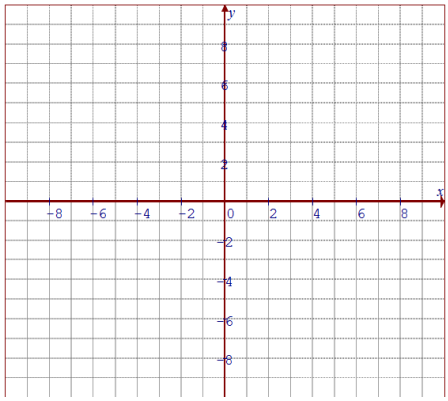


Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

c) $4(x-2)^2 - 2(y-2)^2 = 200$

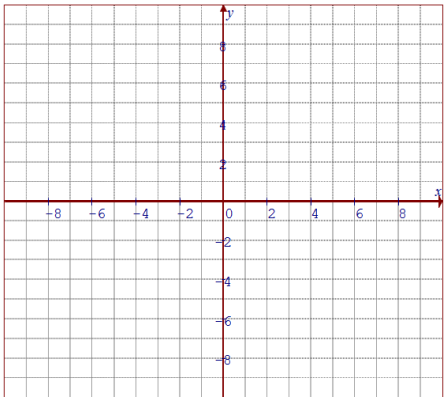


Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

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

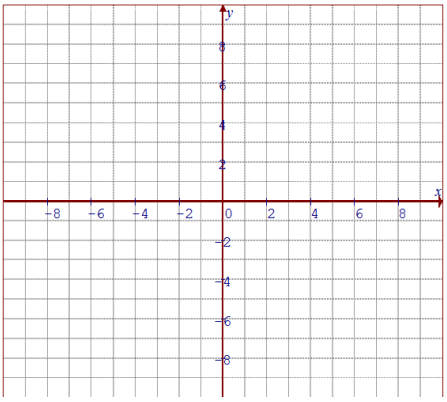


Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

e) $\frac{(x+3)^2}{36} - \frac{(y-4)^2}{25} = 1$

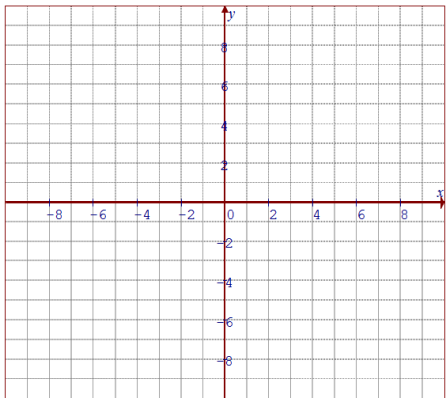


Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

f) $36(x+3)^2 - 49(y-1)^2 = 1764$



Vertices: Asymptotes:

Length of Transverse: Foci:

Domain: Range:

2. Given each equation in general form, find the equation of the asymptote, location of the foci, and the equation in standard form:

$2x^2 - 3y^2 + 4x - 4 = 0$	$4x^2 - 3y^2 + 8x - 9y + 16 = 0$

$9x^2-4y^2+54x+45=0$	$4x^2-3y^2-12x-12y+11=0$

3. Given the diagram of each hyperbola, provide an equation that describes it:

4. Given

4. Given rectangle $PQRS$, with $P(2,5)$, $Q(-5,5)$, $S(2,-1)$, and $R(-5,-1)$, find the equation of the hyperbola whose asymptotes are the diagonals of the rectangle and is tangent to sides PQ and RS.

$\frac{(y-2)^2}{9}-\frac{(x+\frac{3}{2})^2}{\frac{49}{4}}=1$

4. Given rectangle PQRS with P(2,5) Q(-5,5), S(2,-1) and R(-5,-1) find the equation of the hyperbola whose asymptotes are diagonals of the rectangle and is tangent to sides PQ and RS
5. What are the coordinates, in the form of (x,y) of the center of the hyperbola with equation $4x^2-2y^2-16x+20y=0$

What is the distance between the foci of the hyperbola: $\frac{(x-3)^2}{16}-\frac{(y-6)^2}{9}=1$

1. State the coordinates of the vertices, the length of the transverse axis, and the equations of the asymptotes of the rectangular hyperbola defined by each equation:

2. The coordinates of one vertex of a rectangular hyperbola are given. The centre is (0,0). Write an equation of each rectangular hyperbola:

3. Sketch the graphs of these relations on the same grid if possible:

a) $x^2+y^2=9$ b) $x^2+y^2=0$ c) $x^2+y^2=-9$

4. Considering the equation $Ax^2 + By^2 + C = 0$. What coordinates must be satisfied by A, B, and C for this equation to represent each of the following conics:
    a. A circle with centre at the origin

    b. A rectangular hyperbola with the centre at the origin and vertices on the X-axis

    c. A rectangular hyperbola with the centre at the origin and vertices on the Y-axis

5.