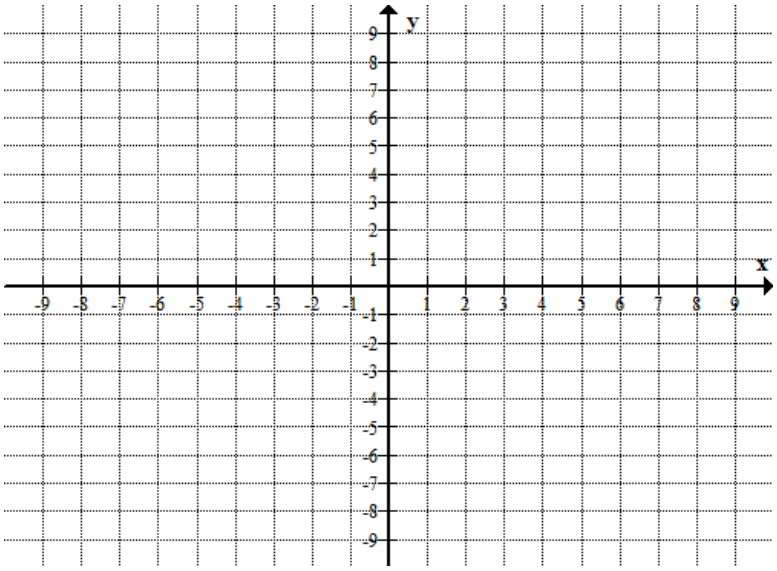
MAC 1140
LA session

Week 10

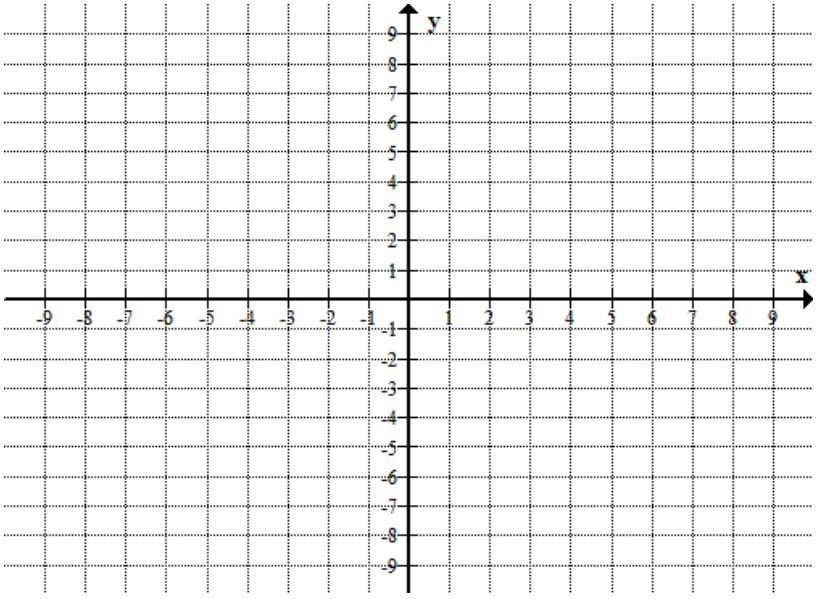
1. Graph the equation $4x^2 - 9y^2 = 36$. Find the coordinates of vertices, foci and the equations of the asymptotes



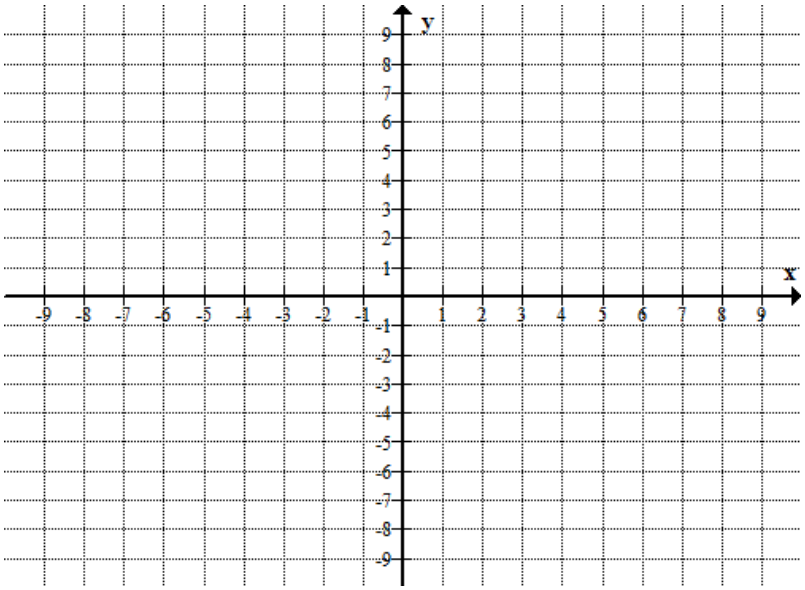
2. Find the standard equation of the hyperbola with center at (0,0), focus at (2,0) and a vertex (-1,0)

3. Graph the given equations. Find the coordinates of the center, foci and vertices. Write the equations of the asymptotes

a) $\dfrac{(y+3)^2}{16} - \dfrac{(x-4)^2}{25} = 1$



b) $4x^2 - 9y^2 + 8x + 54y - 117 = 0$



4. Find the standard equation of the hyperbola with vertices at (-4,4), (-4, 2) and a focus at (-4,0)

5. Find the standard equation of the hyperbola with vertices at (-1,-1), (3,-1) and an asymptote $y = \frac{3}{2}x - \frac{5}{2}$.

6. Assume $0 < r < 9$. Consider the hyperbolas $\frac{x^2}{9-r} - \frac{y^2}{r} = 1$. Do these hyperbolas have vertices on the x-axis or the y axis? Find the coordinates of the foci.

7. Identify conics without completing the squares:
   a) $x^2 - 4y^2 + 2x + 24y = 47$
   b) $2x^2 + 2y^2 - 6x + 4y - 10 = 0$
   c) $3y^2 - 4x^2 - 12y + 16x + 25 = 0$
   d) $x^2 + 4x - 9y + 31 = 0$
   e) $8x^2 + 3y^2 + 32x - 30y + 83 = 0$