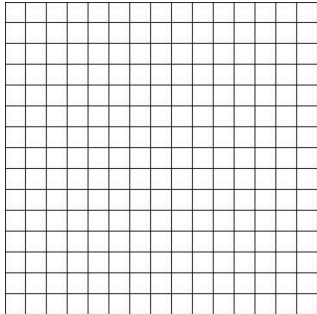


**Aim: Hyperbolas**

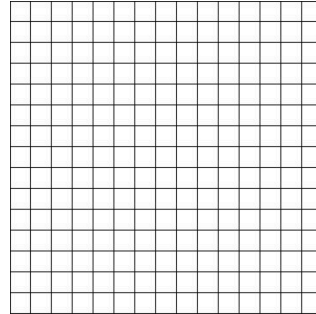
**I. Do Now:** Sketch the graph and find the center, vertices, foci, eccentricity, and equations of asymptotes.

1.  $9x^2 - y^2 = 9$



Center: \_\_\_\_\_  
 Vertices: \_\_\_\_\_  
 Foci: \_\_\_\_\_  
 Eccentricity: \_\_\_\_\_  
 Asymptotes: \_\_\_\_\_

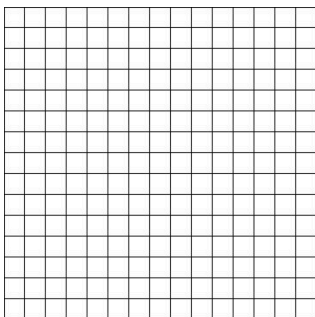
2.  $\frac{(x-1)^2}{4} - \frac{(y+3)^2}{16} = 1$



Center: \_\_\_\_\_  
 Vertices: \_\_\_\_\_  
 Foci: \_\_\_\_\_  
 Eccentricity: \_\_\_\_\_  
 Asymptotes: \_\_\_\_\_

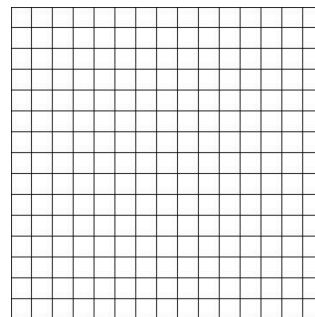
**II. Applications:** Sketch the graph and find the center, vertices, foci, eccentricity, and equations of asymptotes.

3.  $9x^2 - 16y^2 - 18x + 64y + 89 = 0$



Center: \_\_\_\_\_  
 Vertices: \_\_\_\_\_  
 Foci: \_\_\_\_\_  
 Eccentricity: \_\_\_\_\_  
 Asymptotes: \_\_\_\_\_

4.  $x^2 - y^2 + 2x + 2y + 4 = 0$



Center: \_\_\_\_\_  
 Vertices: \_\_\_\_\_  
 Foci: \_\_\_\_\_  
 Eccentricity: \_\_\_\_\_  
 Asymptotes: \_\_\_\_\_

5. Write an equation of a hyperbola if the foci are (4, 0) and (4, 10) and the vertices are (4, 1) and (4, 9).

6. Write an equation of a hyperbola whose vertices are (1, 0) and (-1, 0) and with asymptotes  $y = \pm 4x$ .

7. Write an equation of a hyperbola if the vertices are (5, 3) and (5, -5) and the eccentricity is  $\frac{3}{2}$ .

8. Write an equation of a hyperbola whose vertices are (1, -2) and (1, 2) and that passes through the point (3, 4).