Precalculus – Chapter 9 Test Review

1. Find the vertex, focus and directrix of the parabola and sketch the parabola.

   $(y + 3)^2 = -16(x - 4)$

   vertex: _____

   focus: _____

   directrix: _____

2. Find the equation of the parabola

   a. vertex at (5, –1), focus at (5, 3)   _____

   b. focus at (7, 3), directrix x = 5   _____

3. Find the equation of an ellipse with:

   a. center: (0, 0), focus: (4, 0), major axis of length 10   _____

   b. center: (–2, 5), vertex (3, 5), minor axis of length 4   _____

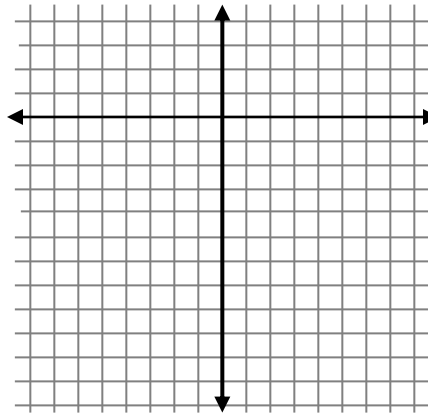4. Find the center, vertices, foci, and eccentricity of the ellipse and sketch its graph

   $$\frac{(x-3)^2}{4} + \frac{(y+6)^2}{16} = 1$$

   center: _____

   vertices: _____

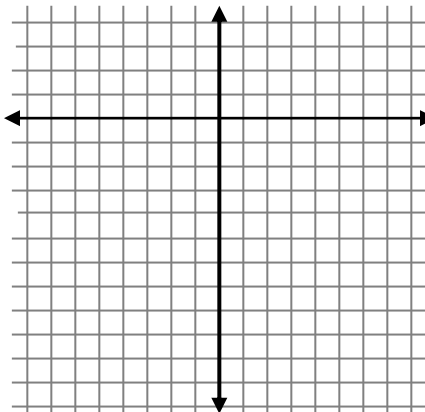   foci: _____

   eccentricity: _____

5. Find the center, vertices, and foci of the hyperbola, and sketch its graph using asymptotes as an aid.

   $$\frac{(x-3)^2}{4} - \frac{(y+6)^2}{8} = 1$$

   center: _____

   vertices: _____

   foci: _____
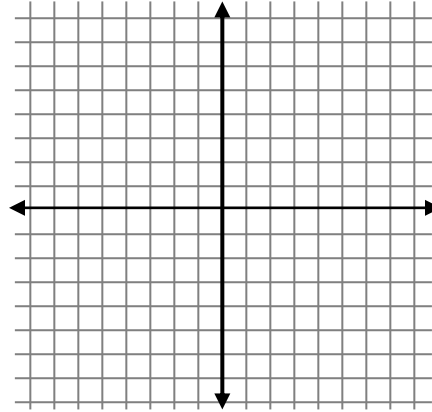

6. Find the equation for the hyperbola

    a. vertices (2, 3) and (2, –1), foci (2, 6) and (2, –4)   _____

7. Find the asymptotes of the hyperbola and sketch: $\dfrac{(y+1)^2}{9} - \dfrac{(x+3)^2}{25} = 1$

asymptotes: _____

8. Identify the graph of each equation

    a. $7x^2 + 5x - 3y + 13 = 0$ _____

    b. $5x^2 + 5y^2 - 7x + 9y - 11 = 0$ _____

    c. $4x^2 + 2y^2 - 11x + 3y - 6 = 0$ _____

    d. $4x^2 - 4y^2 + 4x - 2y + 1 = 0$ _____

9. Write the equation in standard form: $9x^2 + 4y^2 - 54x + 24y + 81 = 0$

Solutions:

1. V(4, –3) f: (0, –3) d: x = 8
2. a) $(x - 5)^2 = 16(y+1)$ b) $(y - 3)^2 = 4(x - 6)$
3. a) $\dfrac{x^2}{25} + \dfrac{y^2}{9} = 1$ b) $\dfrac{(x+2)^2}{25} + \dfrac{(y-5)^2}{4} = 1$
4. c: (3, –6) v: (3, –2) (3, 10)
5. c: (3, –6) v: (5, –6) (1, –6) f: $\left(3 \pm 2\sqrt{3}, -6\right)$
6. $\dfrac{(y-1)^2}{21} - \dfrac{(x-2)^2}{4} = 1$
7. $y = -1 \pm \dfrac{3}{5}(x + 3)$
8. a. parabola b. circle c. ellipse d. hyperbola
9. $\dfrac{(x-3)^2}{4} + \dfrac{(y+3)^2}{9} = 1$