Questions from old Exams

1 Section 8.1

1. Find the equation of the parabola in standard form with focus at $(2, -3)$, and directrix $x = 10$.
2. Write the equation in standard form of the parabola that has vertex $(-4, 1)$, axis of symmetry parallel to the y-axis and passing through the point $(-2, 2)$.
3. Find the vertex, focus, and directrix of the parabola given by the equation $6y - 3x^2 - 12x + 4 = 0$.
4. Find the equation in standard form of the parabola with directrix $x = 4$ and focus $(0, -3)$.
5. The graph of the parabola $x = -y^2 + 6y - 5$:
   (a) has vertex at $(4, 3)$ and opens to the left.
   (b) has vertex at $(31, 6)$ and opens to the left.
   (c) has vertex at $(3, 4)$ and opens to the left.
   (d) has vertex at $(31, 6)$ and opens to the right.
   (e) has vertex at $(4, 3)$ and opens downward.
6. If the distance between the center of the circle $x^2 + y^2 - 2y = 5$ and the vertex of the parabola $x = -5y^2 + m$ is $\sqrt{10}$, then find the value of m.

2 section 8.2

1. Find the center, vertices, and foci of the ellipse $8x^2 + 25y^2 - 48x + 50y + 47 = 0$. Sketch the graph.
2. Find the vertices of an ellipse with center at $(2, 0)$ and major axis of length 6 on the x-axis.
3. Consider the ellipse given by the equation $9x^2 + y^2 + 18x - 6y + 9 = 0$.
   (a) Find its vertices and foci.
   (b) Sketch the graph of the ellipse.
4. Find the standard form of the equation of the ellipse that has foci at $(-3, 0)$ and $(-3, 6)$ and vertices at $(-3, -2)$ and $(-3, 8)$.
5. Find the equation in standard form of the ellipse with eccentricity $\frac{2}{5}$ and foci $(-1, 3)$ and $(3, 3)$.
6. Graph the equation $x = \frac{\sqrt{25-16y^2}}{2}$.
7. Find the equation of the ellipse with center $(3, 1)$, minor axis of length 6 units, and a horizontal major axis of length 9 units.
8. Find the lengths of the major and minor axes and the eccentricity of the ellipse $4(x-1)^2 + 9(y+1)^2 = 36$.

9. Find the lengths of the major and minor axes of the ellipse $4x^2 + 9y^2 - 36 = 0$.

10. The equation of $x^2 - 6x + 4y^2 - 40y + 45 = 0$ is

    (a) an ellipse with center at $(-3, 5)$.
    (b) an ellipse with major axis of length 64.
    (c) a circle with center $(3, -5)$.
    (d) a hyperbola with center $(3, -5)$.
    (e) an ellipse with major axis of length 8.

11. The graph of $x = -\frac{\sqrt{16-9y^2}}{2}$ is

    (a) half a hyperbola.
    (b) a parabola.
    (c) half an ellipse.
    (d) two intersecting lines.
    (e) a circle.

3 Section 8.3

1. Find the coordinates of the foci of the hyperbola $9(y-1)^2 - 16(x+1)^2 = 144$.

2. Find the equations of the asymptotes of the hyperbola $4x^2 - y^2 - 8x - 2y - 13 = 0$.

3. Find the vertices and the equations of the asymptotes of the hyperbola $4x^2 - 9y^2 = 36$.

4. The graph of the equation $12x^2 + 72x + 72 = 9y^2 + 72y$ represents:

    (a) an ellipse with center $(3, 4)$.
    (b) an ellipse with center $(-3, -4)$.
    (c) a hyperbola with center $(-3, -4)$.
    (d) a hyperbola with center $(3, 4)$.
    (e) a parabola with vertex $(3, 4)$.

5. Find the center and the vertices of the hyperbola $25(y+2)^2 - 9(x+3)^2 = 225$.

6. Find the asymptotes of the hyperbola $4x^2 - 8x - 9y^2 + 36y - 68 = 0$.

7. Find the slopes of the asymptotes of the hyperbola with center $(1, -2)$, one focus at $(6, -2)$ and eccentricity $\frac{5}{3}$.

8. Find the foci of the hyperbola $\frac{9(x-1)^2}{64} - \frac{9(y-2)^2}{80} = 1$.