Calculus 1

Mixed Conic Practice

Name:

Show the standard form and the key information you use for each problem.

Parabola

1. Rewrite $y = x^2 - 4x + 1$ in vertex form. Identify the vertex and axis of symmetry.

2. Write the equation of a parabola with vertex $(2, -3)$ and focus $(2, -1)$.

Circle

3. For $(x - 1)^2 + (y + 2)^2 = 16$, identify the center and radius.

4. Write the equation of a circle with center $(-3, 2)$ and radius 4.

Ellipse

5. For $x^2/36 + y^2/16 = 1$, find the center, vertices, co-vertices, and foci.

6. For $(x - 2)^2/9 + (y + 1)^2/25 = 1$, find the center, vertices, co-vertices, and foci.

Ellipse

7. Rewrite $4x^2 + 9y^2 - 8x + 36y + 4 = 0$ in standard form.

Hyperbola

8. For $x^2/16 - y^2/9 = 1$, find the center, vertices, foci, and asymptotes.

9. For $(y - 2)^2/9 - (x + 1)^2/16 = 1$, find the center, vertices, foci, and asymptotes.

10. Write the equation of a hyperbola with center (0, 1), vertices (±3, 1), and foci (±5, 1).

Mixed Standard Form

11. Classify $x^2 + y^2 + 6x - 4y - 12 = 0$ and write it in standard form.

12. Classify $9x^2 - 4y^2 - 18x - 8y - 11 = 0$ and write it in standard form.