

Review Guidelines for Chapter 10 Quadratic Relations and Conic Sections

Show all work neatly on separate graph paper for full credit.

10.1 The Distance and Midpoint Formulas

- ① List the definitions of the four different conic sections. Explain why they are called conic sections.

Find the distance between the two points. Then find the midpoint of the line segment joining the two points.

② $(6, 1), (2, -5)$ ③ $(-2, -5), (4, 6)$

- ④ Write the equation for the perpendicular bisector of a line segment joining $(9, -2)$ and $(-3, 2)$.

10.2 Parabolas

- ⑤ List the two standard forms for parabolas and explain how their graphs differ.

Graph the equation. Identify the focus and directrix of the parabola.

⑥ $y^2 = 16x$ ⑦ $x^2 = 12y$

Write the standard form of the equation of a parabola with the given directrix and vertex at $(0, 0)$.

⑧ $y = \frac{1}{2}$

10.3 Circles

- ⑨ Describe how the distance formula is used to derive the standard form for the equation of a circle.

Graph the equation. Give the radius of the circle.

⑩ $x^2 + y^2 = 16$

⑪ $3x^2 + 3y^2 = 21$

Write the standard form of the equation of the circle that passes through the given point and whose center is the origin.

⑫ $(2, 1)$

10.4 Ellipses

- ⑬ List the two forms of the standard equation for an ellipse and describe how their graphs differ.

Graph the equation. Identify the vertices, co-vertices, and foci of the ellipse.

⑭ $\frac{x^2}{4} + \frac{y^2}{16} = 1$

10.5 Hyperbolas

- ⑮ List the two forms for the standard equation for a hyperbola and describe how their graphs differ.

Graph the equation. Identify the foci and the asymptotes.

⑰ $\frac{x^2}{4} - \frac{y^2}{9} = 1$ ⑱ $\frac{y^2}{25} - \frac{x^2}{9} = 1$

10.6 Graphing and Classifying Conics

- ⑳ Describe how to classify the conic section you have if given the equation in the general second degree form.

Classify the conic section and write its equation in standard form. Graph.

㉑ $x^2 + y^2 - 12x - 18y - 4 = 0$ ㉒ $x^2 + 10x - 4y + 1 = 0$
 ㉓ $x^2 + 4y^2 + 6x - 8y + 9 = 0$ ㉔ $4x^2 - 3y^2 + 8x + 16 = 0$

10.7 Solving Quadratic Systems

- ㉕ Explain what it means (graphically) to solve a system of equations

Find the points of intersection, if any, of the graphs in the systems.

㉖ $\begin{cases} 2x^2 + 3y^2 = 19 \\ x^2 + y^2 = 9 \end{cases}$

㉗ $\begin{cases} x^2 = 2y \\ x + y = 4 \end{cases}$