# 9 CHAPTER TEST

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

**1.** $(-1, 5), (7, 3)$

**2.** $(4, 2), (8, 8)$

**3.** $(-1, -6), (1, 5)$

**4.** $(2, -5), (3, 1)$

**5.** $(-6, -2), (-3, 5)$

**6.** $(1, 9), (10, -2)$

**Graph the equation.**

**7.** $y^2 - 24x = 0$

**8.** $x^2 + y^2 = 16$

**9.** $64y^2 - x^2 = 64$

**10.** $18x^2 + 2y^2 = 18$

**11.** $(x - 6)^2 + (y + 1)^2 = 36$

**12.** $(x + 4)^2 = 6(y - 2)$

**13.** $\frac{(x + 4)^2}{9} - \frac{(y - 7)^2}{49} = 1$

**14.** $\frac{(x - 8)^2}{81} + \frac{(y - 2)^2}{100} = 1$

**15.** $\frac{(y - 5)^2}{9} - (x + 3)^2 = 1$

**Write the standard form of the equation of the conic section with the given characteristics.**

**16.** Parabola with vertex at $(0, 0)$ and directrix at $x = -6$

**17.** Parabola with vertex at $(-2, -1)$ and focus at $(-2, 5)$

**18.** Circle with center at $(0, 0)$ and passing through $(-5, 2)$

**19.** Circle with center at $(1, -4)$ and radius 6

**20.** Ellipse with center at $(0, 0)$, vertex at $(0, 6)$, and co-vertex at $(-3, 0)$

**21.** Ellipse with vertices at $(-1, 4)$ and $(7, 4)$ and foci at $(1, 4)$ and $(5, 4)$

**22.** Hyperbola with vertices at $(0, -6)$ and $(0, 6)$ and foci at $(0, -9)$ and $(0, 9)$

**23.** Hyperbola with vertex at $(2, -5)$, focus at $(-1, -5)$, and center at $(5, -5)$

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

**24.** $x^2 + 4y^2 - 6x - 16y + 21 = 0$

**25.** $x^2 + y^2 + 8x + 12y + 3 = 0$

**26.** $4x^2 - 9y^2 - 40x + 64 = 0$

**27.** $y^2 - 16y - 12x + 40 = 0$

**28.** $25x^2 + 4y^2 + 50x - 24y - 39 = 0$

**29.** $y^2 - 16x^2 + 14y + 64x - 31 = 0$

**Solve the system.**

**30.** $4x^2 + y^2 = 16$
$x + y = 2$

**31.** $x^2 + 4y^2 - 8y = 4$
$y^2 - 2y - 8x - 16 = 0$

**32.** $y^2 - x^2 + 2x - 5 = 0$
$x^2 + y^2 - 2x - 3 = 0$

**33.** **WATER SURFACE** A cylindrical glass of water has a 1.5 inch radius. If the glass is tilted 60°, the water's surface meets the glass in an ellipse with minor axis 3 inches long and major axis 6 inches long. Write equations that model the water's surface with the glass upright and after the glass is tilted. Use the center of the water's surface as the origin.

**34.** **ASTRONOMY** The Green Bank Telescope in West Virginia has a main reflector whose cross section is a portion of a "parent" parabola. A diagram of the reflector's cross section and the parent parabola is shown. Write an equation that models the parent parabola if its vertex is at $(0, 0)$. What is the distance from the vertex to the focus?