

9.6 EXERCISES

HOMWORK KEY

 = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 3, 19, and 49

 = **TAKS PRACTICE AND REASONING**
Exs. 12, 36, 45, 51, 52, 54, and 55

SKILL PRACTICE


- VOCABULARY** Explain why circles, ellipses, parabolas, and hyperbolas are called conic sections.
- WRITING** Explain how the discriminant of a general second-degree equation can be used to identify what conic the equation represents.

GRAPHING Graph the equation. Identify the important characteristics of the graph.

- $(x + 4)^2 = -8(y - 2)$
- $\frac{(y + 4)^2}{49} - \frac{(x + 8)^2}{9} = 1$
- $(y - 1)^2 = 4(x + 6)$
- $(x - 2)^2 + (y - 7)^2 = 9$
- $\frac{(x - 6)^2}{25} - (y + 1)^2 = 1$
- $\frac{(x + 2)^2}{16} + \frac{(y - 2)^2}{36} = 1$
- $(x - 5)^2 + (y + 1)^2 = 64$
- $\frac{x^2}{25} + \frac{(y - 2)^2}{4} = 1$
- $\frac{(x + 3)^2}{9} - \frac{(y - 4)^2}{16} = 1$

- TAKS REASONING** What are the coordinates of the co-vertices of the ellipse with equation $\frac{(x - 4)^2}{16} + \frac{(y - 1)^2}{4} = 1$?
(A) (0, 1), (8, 1) **(B)** (-8, 1), (0, 1) **(C)** (4, 3), (4, -1) **(D)** (-4, 3), (-4, -1)

WRITING EQUATIONS Write an equation of the conic section.

- Circle with center at (-5, 1) and radius 6
- Circle with center at (9, -1) and radius 2
- Parabola with vertex at (-4, -3) and focus at (1, -3)
- Parabola with vertex at (5, 3) and directrix $y = 6$
- Ellipse with vertices at (-3, 4) and (5, 4) and foci at (-1, 4) and (3, 4)
- Ellipse with vertices at (-2, 1) and (-2, 9) and co-vertices at (-4, 5) and (0, 5)
- Hyperbola with vertices at (6, -3) and (6, 1) and foci at (6, -6) and (6, 4)
- Hyperbola with vertices at (1, 7) and (7, 7) and foci at (-1, 7) and (9, 7)
- ERROR ANALYSIS** Describe and correct the error in writing an equation of the ellipse with vertices at (-7, 3) and (3, 3) and co-vertices at (-2, 6) and (-2, 0).
 Axis is horizontal; $(h, k) = (-2, 3)$;
 $a = |-7 - (-2)| = 5$; $b = |6 - 3| = 3$;
 Equation: $\frac{(x - 2)^2}{25} + \frac{(y + 3)^2}{9} = 1$ 

LINES OF SYMMETRY Identify the line(s) of symmetry for the conic section.

- $\frac{(x + 5)^2}{49} + \frac{(y - 2)^2}{16} = 1$
- $(y - 4)^2 = 6(x + 6)$
- $\frac{(x - 1)^2}{36} - \frac{(y - 2)^2}{9} = 1$
- $(y - 5)^2 - \frac{(x - 3)^2}{9} = 1$
- $(x + 3)^2 = 10(y - 1)$
- $(x + 2)^2 + (y + 1)^2 = 121$

EXAMPLES 1 and 2

on pp. 650–651
for Exs. 3–12

EXAMPLES 3 and 4

on pp. 651–652
for Exs. 13–21

EXAMPLE 5

on p. 652
for Exs. 22–27