SKILLS Objective B
In 1 and 2, write an equation for an ellipse satisfying the given conditions.

1. The endpoints of the major and minor axes are (6, 0), (−6, 0), (0, 4), and (0, −4).

2. The foci are at (0, 5) and (0, −5) and the focal constant is 26.

PROPERTIES Objective E
3. For the ellipse with equation \( \frac{x^2}{100} + \frac{y^2}{51} = 1 \), find the
   a. length of the major axis. 
   b. length of the minor axis. 
   c. \( x \)- and \( y \)-intercepts. 
   d. coordinates of the foci.

4. Find the focal constant of the ellipse with equation \( \frac{x^2}{24} + \frac{y^2}{49} = 1 \).

PROPERTIES Objective F
In 5–7, determine whether the figure described is a parabola, a circle, or an ellipse.

5. The set of all points whose distances from \((p, q)\) and \(y = t\) are equal.

6. The set of all points whose distance from \((p, q)\) is \(a\).

7. The set of all points whose distances from \((x_1, y_1)\) and \((x_2, y_2)\) sum to \(a\).

USES Objective G
8. A leash on Grinsby’s collar attached to a 24-foot rope looped around two trees which are 14 feet apart allows the dog to walk freely in the backyard. Consider a graph in which each unit represents one foot. Place the origin halfway between the trees and place the trees (represent them as points) on the \(x\)-axis. Write an equation to represent the boundary of Grinsby’s play area.

9. The orbit of Mars around the sun approximates an ellipse with the sun at one focus \((F_1)\). The closest and farthest distances of Mars from the center of the sun are 128.5 and 155.0 million miles, respectively.
   a. About how far is \(F_2\), the second focus, from the center of the sun?
   b. What is the approximate length of the orbit’s minor axis?
12-4B

REPRESENTATIONS  Objective I

10. Write an equation for the ellipse graphed at the right.

11. Graph the ellipse with equation \( \frac{x^2}{4} + \frac{y^2}{9} = 1 \) on the grid at the right.

REPRESENTATIONS  Objective L

12. Sketch an ellipse with foci at (0, 4) and (0, -4) and minor axis length 6 on the grid below.

13. Graph the set of points whose distances from \((\sqrt{15}, 0)\) and \((-\sqrt{15}, 0)\) add to 8 below.