

**Example 1:** Graph the ellipse using a graphing calculator. Sketch the results below.

$$\frac{(x - 1)^2}{4} + \frac{(y + 2)^2}{16} = 1$$

The **eccentricity** of an ellipse measures how oval the shape is. It is given by the ratio  $e = \frac{c}{a}$  where  $0 < e < 1$  for every ellipse. When an ellipse is nearly circular, the ratio of  $c/a$  is very small. A more elongated ellipse will have the ratio close to 1.

**Example 2:** Identify the conic as a circle or an ellipse. Then find the center, radius, vertices, foci, and eccentricity of the conic (if applicable), and sketch its graph.

a.  $x^2 + y^2 - 4x + 6y - 3 = 0$

**Example 3:** Identify the conic as a circle or an ellipse. Then find the center, radius, vertices, foci, and eccentricity of the conic (if applicable), and sketch its graph.

$$x^2 + 5y^2 - 8x - 30y - 39 = 0$$