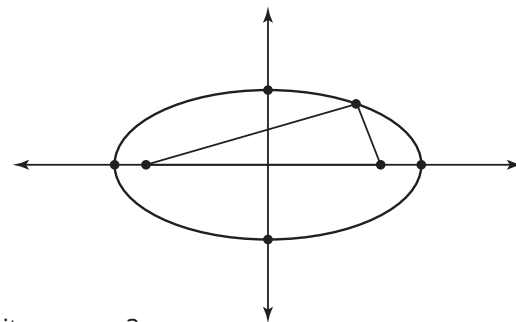


# Assignment

## Write

Label the diagram of the ellipse with each term.

1. major axis
2. vertices
3. minor axis
4. co-vertices
5. foci
6. What is the formula for the eccentricity of an ellipse? What does it measure?



## Remember

An ellipse is the locus of points in a plane for which the sum of the distances from two given points is a constant.

The equation of an ellipse with the center at the origin is  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  when the longer or major axis is on the x-axis, and  $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$  when the major axis is on the y-axis.

## Practice

1. Use the equation of the ellipse to identify the center, vertices, foci, eccentricity, minor axis endpoints, and the lengths of the minor and major axes.

a.  $\frac{x^2}{25} + \frac{y^2}{9} = 1$

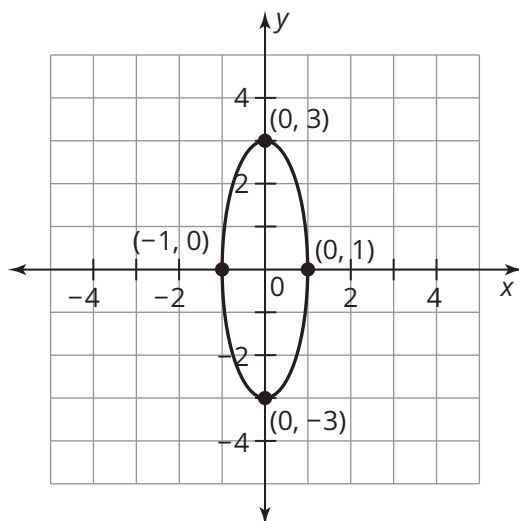
b.  $\frac{x^2}{5} + \frac{y^2}{16} = 1$

c.  $\frac{(x-3)^2}{4} + \frac{(y+2)^2}{9} = 1$

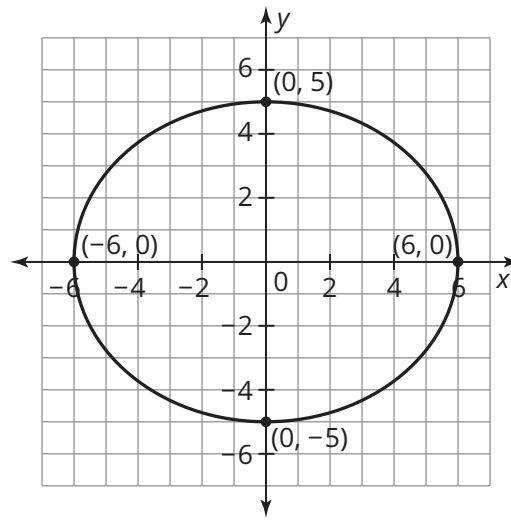
d.  $\frac{(x-4)^2}{40} + \frac{(y+1)^2}{36} = 1$

2. Identify the center, vertices, and lengths of the major and minor axes of each ellipse. Then write the equation of the ellipse in standard form.

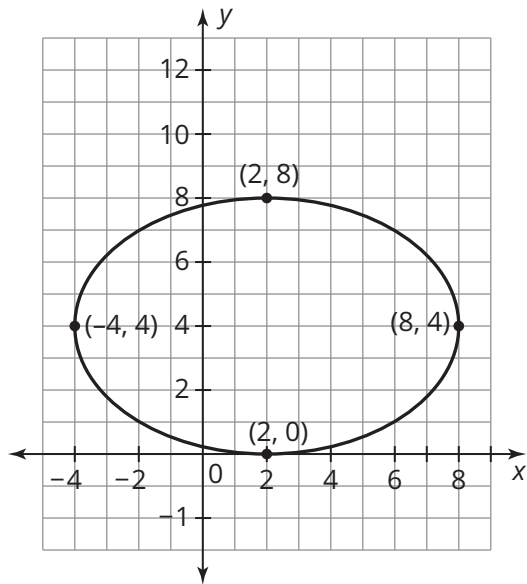
a.



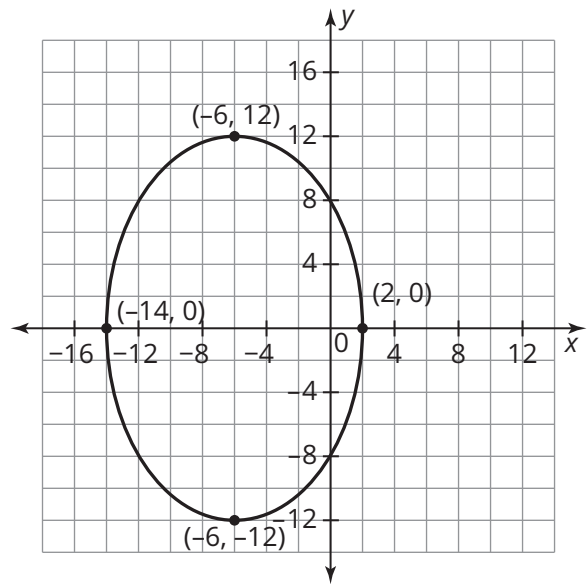
b.



c.



d.



3. Rewrite the equation of the ellipse in standard form. Then graph the ellipse and label the center, vertices, and minor axis endpoints.

a.  $y^2 = 1 - \frac{x^2}{4}$

b.  $x^2 + 4y^2 = 100$

c.  $9(x + 1)^2 + 7(y + 5)^2 = 63$

d.  $(x - 2)^2 = 225 - \frac{9(y + 2)^2}{16}$

## Stretch

Graph the ellipse given the characteristics.

Eccentricity:  $\frac{4}{5}$

Center:  $(-7, -1)$

Vertex:  $(-12, -1)$

## Review

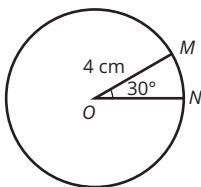
1. Write an equation in standard form for each parabola.

a. A parabola with a vertex of  $(2, 5)$  and a focus of  $(-1, 5)$ .

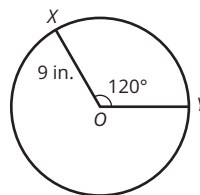
b. A parabola with a vertex of  $(4, 0)$  and a directrix of  $y = 2$ .

2. Determine the area of each sector.

a.



b.



3. Solve for  $x$ .

a.  $2x^2 - 5x + 3 = 0$

b.  $5x^2 + 8x + 4 = 0$