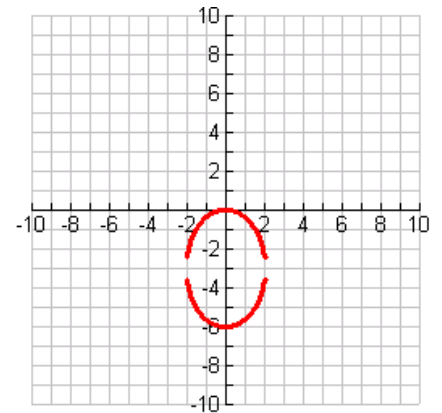
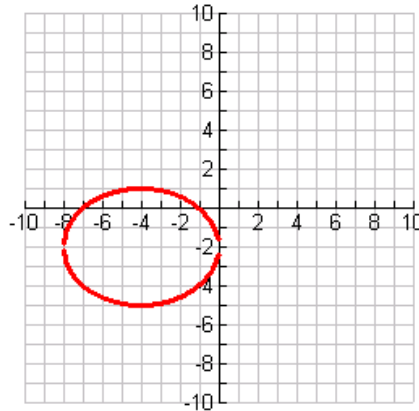
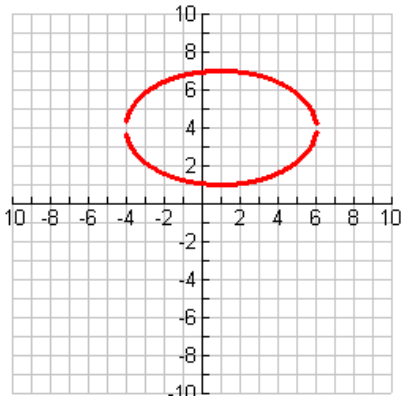


### Ellipse Example:

In the equation,  $\frac{x^2}{25} + \frac{y^2}{16} = 1$ ,  $a^2 = 25$  so  $a = \pm 5$  and two of the ellipse vertices are located horizontally 5 units right and left of the center at (5, 0) and (-5, 0).  $b^2 = 16$  so  $b = \pm 4$  and the two co-vertices are located vertically 4 units above and below the center at (0, 4) and (0, -4). Because  $25 > 16$ , the major axis lies horizontally with a length of 10 ( $2a = 2(5) = 10$ ). The foci are on the x-axis.

### Ellipses Practice:

1.a. Write an equation in standard form for each graph below.

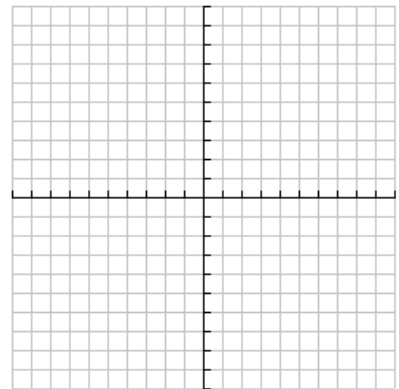
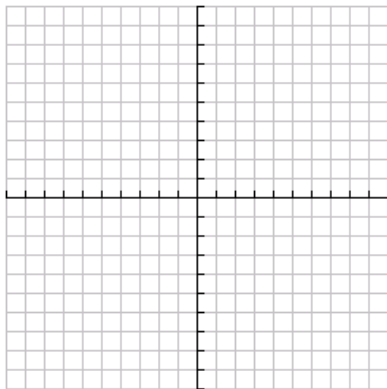


b. On separate paper, rewrite the equations in general form.

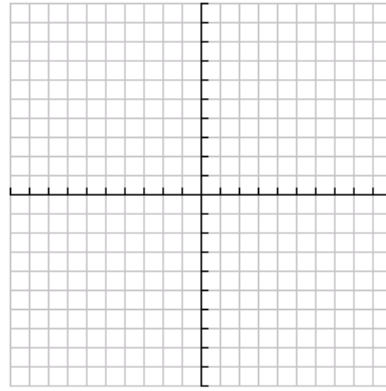
2. Graph each ellipse. In the space below, identify the major axis, vertices, co-vertices, and focus points. Find the lengths of the major and minor axes.

a.  $\frac{x^2}{9} + \frac{y^2}{16} = 1$

b.  $4x^2 + 9y^2 = 36$



c.  $4(x - 3)^2 + 9(y + 2)^2 = 36$



3. Use completing the square to change each general form ellipse to standard form. Next change the standard form equation to equations ready to be graphed using function graphing technology. Identify an appropriate graphing window.

a.  $9x^2 + 4y^2 + 8y - 32 = 0$

b.  $x^2 + 4y^2 + 6x - 8y - 3 = 0$