

MATH 1650: SECTION 7.4: ELLIPSES

THE ALTERNATE STANDARD EQUATION OF A CIRCLE:

The equation of a circle with center (h, k) and radius $r > 0$ is

$$\frac{(x - h)^2}{r^2} + \frac{(y - k)^2}{r^2} = 1$$

THE STANDARD EQUATION OF AN ELLIPSE:

For positive unequal numbers a and b , the equation of an ellipse with center (h, k) is

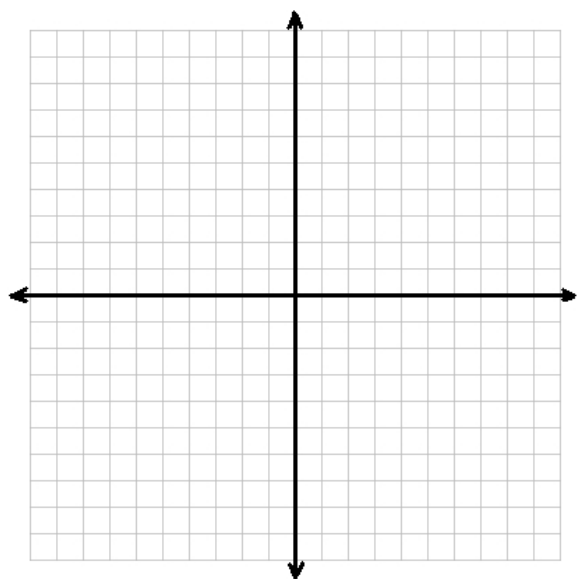
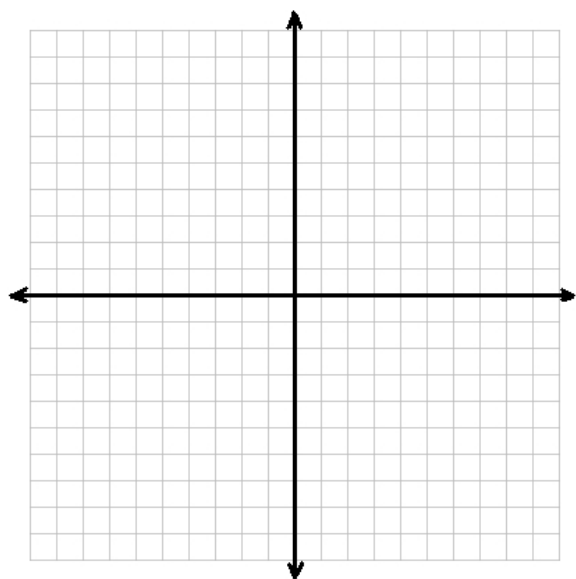
$$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$$

EXAMPLE:

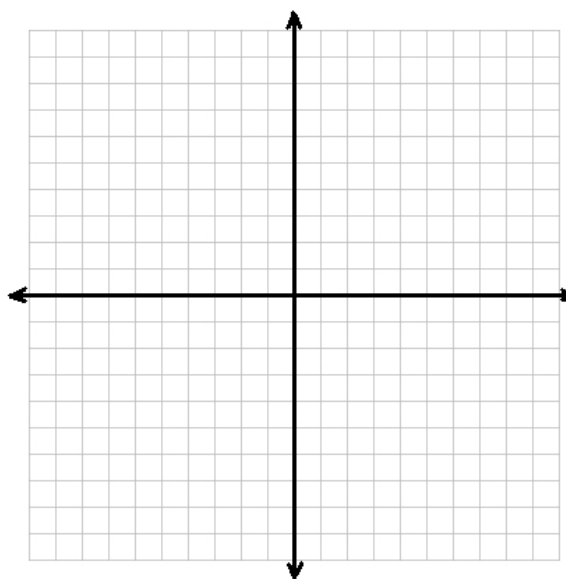
- Graph each of the following equations below in the xy -plane. Find the center, the lines which contain the major and minor axes, the vertices, the endpoints of the minor axis, and the foci.

(a) $25(x + 1)^2 + 9(y - 2)^2 = 225$.

(b) $x^2 + 4y^2 - 2x + 24y + 33 = 0$.



2. Graph $f(x) = 1 + 2\sqrt{-x^2 - 4x - 3}$



3. Find the standard form of the equation of an ellipse which satisfies the following characteristics:

(a) the foci are at $(2, 1)$ and $(4, 1)$ and vertex $(0, 1)$.

(b) the ellipse graphed below:

