The Math Center presents:

A Tip Sheet on

THE ELLIPSE

1. **Complete the square**.

2. **Write the equation in general form**.

$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ *Example*: $\frac{x^2}{16} + \frac{y^2}{9} = 1$

Is really: $\frac{(x-0)^2}{16} + \frac{(y-0)^2}{9} = 1$

3. **Major and Minor Axes**:
If a, then x is the major axis and y is the minor axis. 2 > b 222
If b, then y is the major axis and x is the minor axis.

4. Center: (h, k)
Look at the general form for (h,k).

Example: $\frac{(x+3)^2}{4} + \frac{(y-1)^2}{16} = 1$

What makes x – h = 0?
What makes y – k = 0?

Center is (-3, 1)

5. Foci:

If b 2 > a 2 , c = ± $\sqrt{b^2 - a^2}$ This result, c, is added to the y-value of the ordered pair of the center of the ellipse. This is on the major axis.

If a 2 > b 2 , c = ± $\sqrt{a^2 - b^2}$ This result, c, is added to the x-value of the ordered pair of the center of the ellipse. This is on the major axis.

The foci are points a distance away from the center point in the negative and positive directions, on the major axis, inside the ellipse.