

# 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  $a > b$ , then  $x$  is the major axis and  $y$  is the minor axis.  
 If  $b > a$ , 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  $a > b$ ,  $c = \pm \sqrt{a^2 - b^2}$ . 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  $b > a$ ,  $c = \pm \sqrt{b^2 - a^2}$ . 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.**

MCC offers a **Math Lab** at both the Bedford and Lowell campuses. Tutoring is available weekdays and some evenings, at no charge. Schedules are posted on the door. Drop in.

**In Bedford:** AR 214, Tel: (781) 280-3707

**In Lowell:** City Campus, Room 406, Tel. (978) 656 - 3368