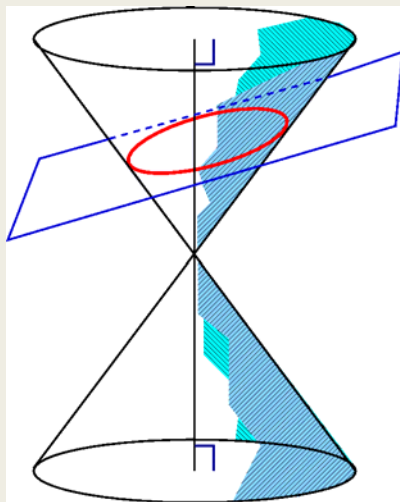


7-2: CIRCLES AND ELLIPSES

CP Precalculus
Mr. Gallo

Slice a cone with a plane on a slant and get an ellipse.



Ellipses

■ Equation for Ellipse:
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

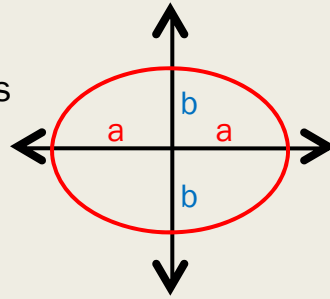
Center = (h, k)

a = how far to count out horizontally from the center

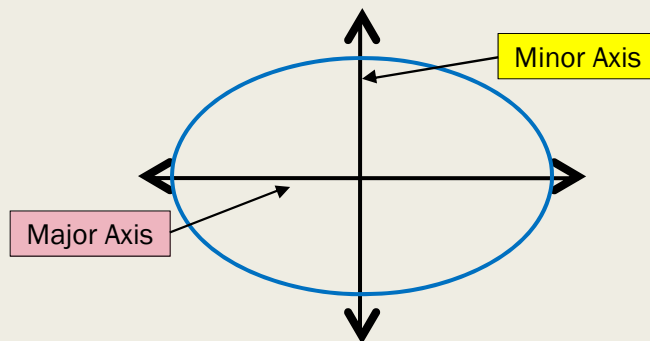
2a = length of horizontal axis

b = how far to count out vertically from the center

2b = length of vertical axis



- MAJOR AXIS = the longer axis of the two
- MINOR AXIS = the shorter of the two axes



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

If $b > a$, then the ellipse lies vertically.



If $a > b$, then the ellipse lies horizontally.



If $a = b$, then the ellipse is a circle.



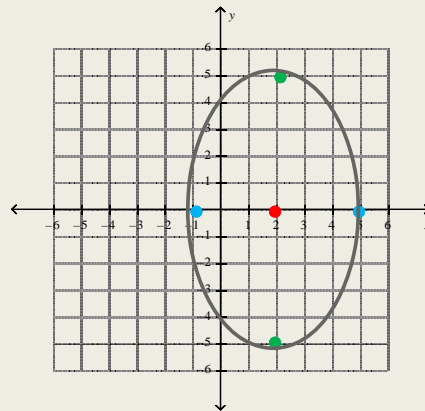
Graphing an Ellipse

■ Graph $\frac{(x-2)^2}{9} + \frac{y^2}{25} = 1$

1. Locate the center $(2,0)$
2. Count out "a" horizontally
3. Count out "b" vertically
4. Connect the dots

$$a = \sqrt{9} = 3$$

$$b = \sqrt{25} = 5$$



Determine the equation for and graph an ellipse centered at the origin with a horizontal axis of length 10 and a vertical axis of length 4.

$$(h, k) = (0, 0)$$

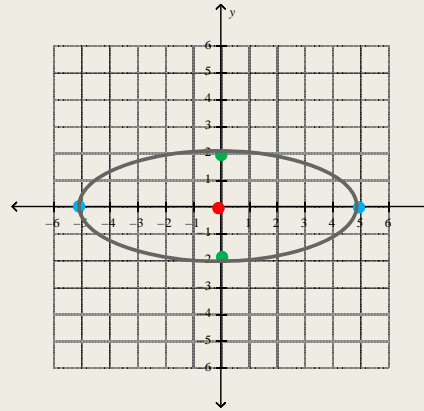
$$a = 2a = 10 \quad b = 2b = 4$$

$$a = 5 \quad b = 2$$

$$\frac{(x-0)^2}{5^2} + \frac{(y-0)^2}{2^2} = 1$$

$$\frac{x^2}{25} + \frac{y^2}{4} = 1$$

$$\text{Also written as: } 4x^2 + 25y^2 = 100$$



Graph the ellipse with the equation: $25x^2 + 4y^2 = 100$

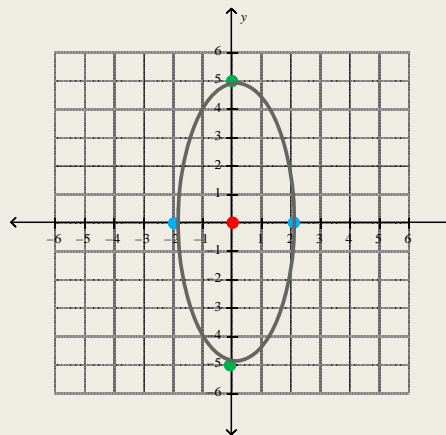
$$(h, k) = (0, 0)$$

$$a = \sqrt{4} = 2$$

$$b = \sqrt{25} = 5$$

$$\frac{25x^2}{100} + \frac{4y^2}{100} = \frac{100}{100}$$

$$\frac{x^2}{4} + \frac{y^2}{25} = 1$$

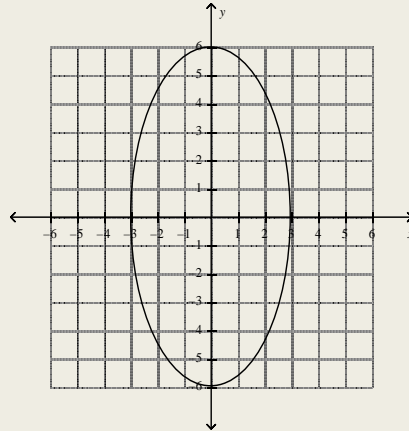


Closure

- Write an equation for the following ellipse.
- Center = $(0,0)$
- $a = \underline{3}$
- $b = \underline{6}$

$$\frac{x^2}{3^2} + \frac{y^2}{6^2} = 1$$

$$\frac{x^2}{9} + \frac{y^2}{36} = 1$$



Homework: 7-2 Ellipse Homework WS