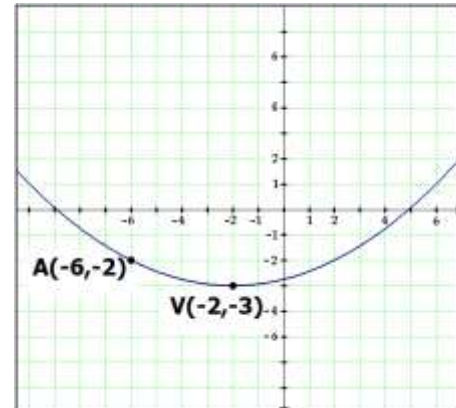


9/10/20 SHOW ALL WORK!!! DO YOUR OWN WORK!!! DO NOT USE THE MAC TO DO THE WORK!!

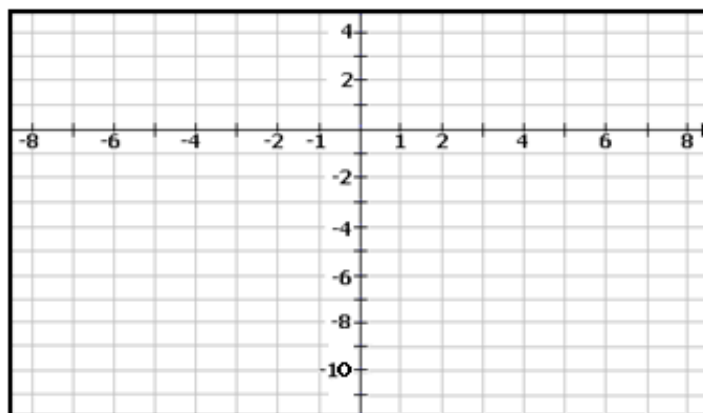
Only use forms of equations that come from Chapter 11 when answering questions about parabolas, ellipses, and hyperbolas.

- (1) Find the **equation** for the **parabola** shown in the figure below. The points shown on the figure below are $V(-2, -3)$, and $A(-6, -2)$



- (2) After putting this equation into the correct form for this parabola, **find** and **label** the **vertex**, **focus**, and **directrix** of the parabola. **Sketch** its **graph**, showing the focus and the directrix and **y-intercepts**.

$$y^2 + 12x + 8y - 8 = 0$$

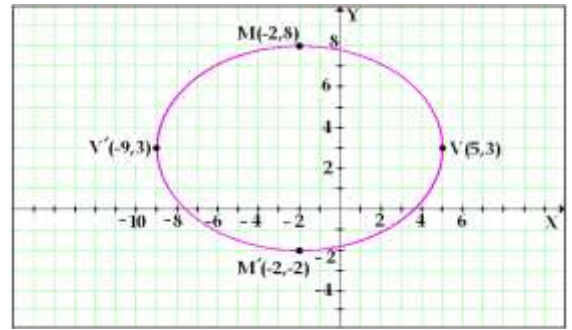


Vertex is $V(\quad , \quad)$, **Focus** is $F(\quad , \quad)$, and **directrix** is the equation _____

- (3) **Food and Drink Sales.** A community center set up a music event to raise money for construction of a new activity center. Two kinds of tickets were sold. The \$4 ticket was for just one drink, the \$9 dollar ticket was for a meal and a drink. Every one attending the event bought at least one ticket. At the end of the night, the total number of tickets sold was 208 and the event raised \$1277. **How many drink tickets were sold and how many meal and drink tickets were sold?**

[Remember to assign variable names to the two kinds of tickets then set up and solve a system of equations involving those variables. Then in series of logical steps solve the equation. Do not write down a number without showing work or arrive at a solution by trial and error.]

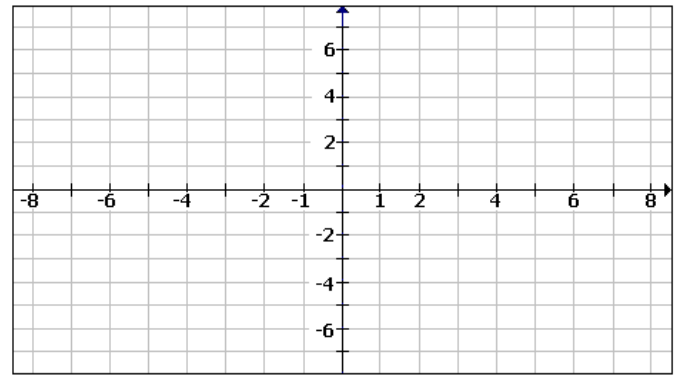
- (4) Find the **equation** for the ellipse shown in the figure below. The points shown on the figure below are $V(5, 3)$, $V'(-9, 3)$, $M(-2, 8)$, and $M'(-2, -2)$.



[Note: M and M' denotes the ends of the minor axis]

- (5) After putting the equation in the correct form for this **ellipse**, find and label the **vertices** and **foci** of the ellipse. Sketch its graph.

$$4y^2 - 250x + 25x^2 - 16y + 541 = 0$$

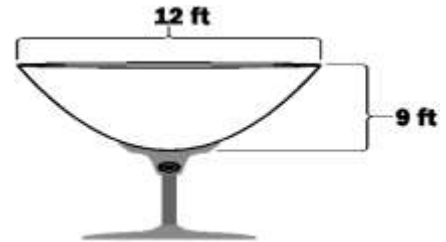


Center = $(h, k) = (\quad , \quad)$

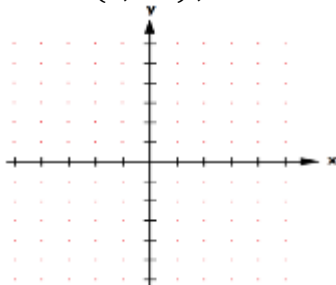
Vertices are $V' (\quad , \quad)$ and $V (\quad , \quad)$, **Foci** are $F' (\quad , \quad)$ and $F (\quad , \quad)$

[Vertices are the ends of the major axis; the other two are the end points of the minor axis]

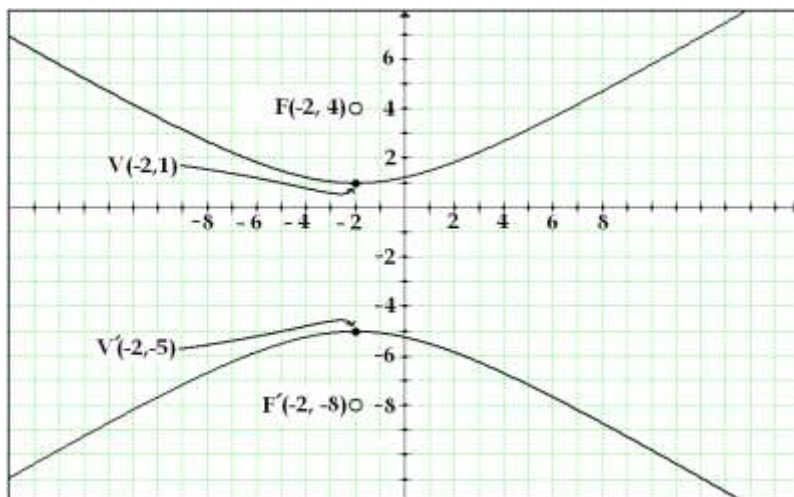
- (6) **Antenna Dish.** A satellite antenna dish has a shape of a paraboloid that is 12 feet across at the open end and is 9 feet deep. At what distance from the bottom center of the dish should the receiver be placed to receive the greatest intensity of the satellite signal.



- (7) Find the **equation** for the **ellipse** that has its center at the origin and satisfies the given conditions
Foci $(0, \pm 4)$, Vertices $(0, \pm 6)$



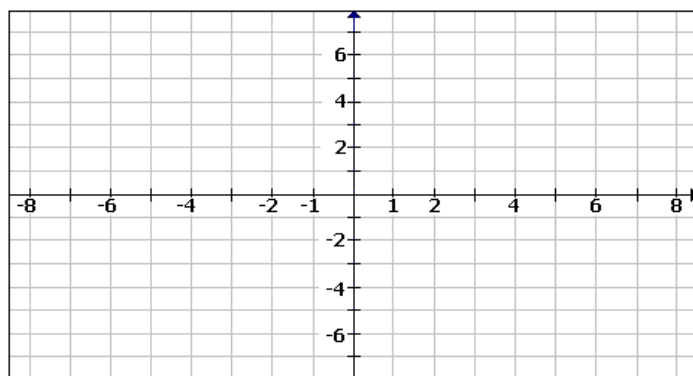
- (8) Find the **equation** for the **hyperbola** shown in the figure below. The points shown on the figure below are $V(-2, 1)$, $V'(-2, -5)$, $F(-2, 4)$, and $F'(-2, -8)$.



[Note: V and V' denotes the ends of the transverse axis]

- (9) After putting the equation into the correct form for this **hyperbola**, find and label the **vertices** and **foci** and **sketch** its **graph**.

$$25y^2 - 16x^2 = 400$$



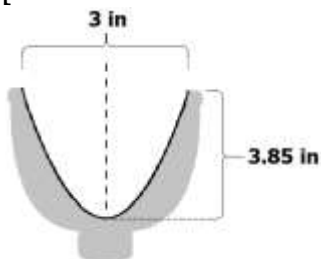
Center = $(h, k) = (\quad , \quad)$

Vertices are $V' (\quad , \quad)$ and $V (\quad , \quad)$, **Foci** are $F' (\quad , \quad)$ and $F (\quad , \quad)$

[**Vertices** are the ends of the transverse axis]

- (10) **Special Bulb Design.** The interior of a light housing is a mirrored dish having the shape of a paraboloid that has diameter of 3 inches at the opening and is 3.85 inches deep, as shown below. The bulb should be placed at the focus to reflect the most light. **Find the focus.**

[Think of the focus and remember to set up an equation to solve]



(11) Use **elimination** to solve.

$$\begin{cases} 3x + 5y = 4 \\ x - y = 1 \end{cases}$$

(12) Solve

$$\begin{cases} x^2 + y^2 = 16 \\ y + 2x = -1 \end{cases}$$

ExtraCredit:

(1) What is between the **focus** and **directrix** in a parabola?

(2) Solve $\begin{cases} x^2 - y^2 = 1 \\ y^2 - x^2 = -1 \end{cases}$

(3) Find one of the **equations** of one of the asymptotes in **Problem #9** from the test.

(4) If firemen see a house on fire, do they have to stop by law and try to put it out?