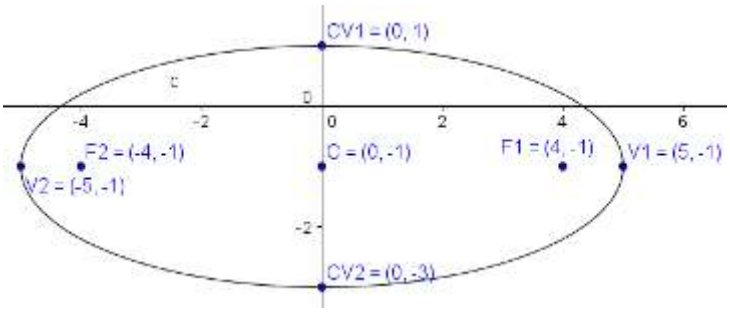


GeoGebra Dynamic Worksheet: Ellipse 1 Answer Sheet

Go to www.doublecrosseducation.com/fetc.htm. Click on Ellipse 1.
This shows the graph of the ellipse in the form:

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

You can manipulate the graph by changing the value(s) of h, k, a, and b which are called the **parameters** of the equation. In this worksheet we will examine how each of these parameters changes the graph of the ellipse.

- *Start with h = 0 k = 0 and a = 2, b = 3.*

1. Write the equation of this ellipse using the form above (NOT the form shown on the worksheet) $\frac{x^2}{4}+\frac{y^2}{9}=1$
2. What is the orientation (horizontal or vertical) of the ellipse? *Vertical*
3. Write the coordinates of:
   i. the center *(0,0)*
   ii. the endpoints of the major axis *(0,3) (0, -3)*
   iii. the endpoints of the minor axis *(2, 0) (-2,0)*

- *Set h = 0, k = 0, a = 3, b = 2.*

4. Write the equation for this ellipse. $\frac{x^2}{9}+\frac{y^2}{4}=1$
5. What is the orientation (horizontal or vertical) of the ellipse? *Horizontal*
6. Write the coordinates of:
   i. the center *(0,0)*
   ii. the endpoints of the major axis *(3,0) (-3,0)*
   iii. the endpoints of the minor axis *(0, 2) (0, -2)*

- *Set h = 2, k = 0, a = 2, b = 3.*

7. Write the equation for this ellipse. $\frac{(x-2)^2}{4}+\frac{y^2}{9}=1$

8. Write the coordinates of:
   i. the center *(2,0)*
   ii. the endpoints of the major axis *(2,3) (2, -3)*
   iii. the endpoints of the minor axis *(0, 0) (0, 4)*

- *Set h = -2, k = -1, a = 2, b = 5.*

9. Write the equation for this ellipse. $\frac{(x+2)^2}{4}+\frac{(y+1)^2}{25}=1$

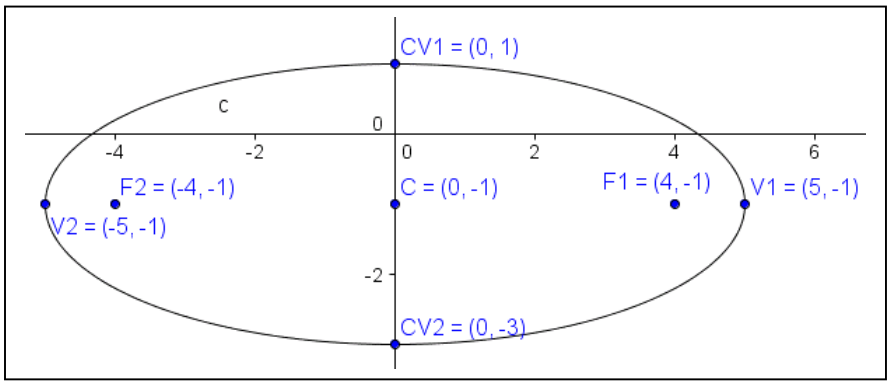
10. Write the coordinates of:
    i. the center *(-2, -1)*
    ii. the endpoints of the major and minor axis *Major: (-2,4) (-2,-6)*
    Minor: (0,-2) (-4,-2)

- Summarize how changing the value of h and k, a and b in the equation affects the graph of the ellipse. Include any effects on the center, major and minor axes.

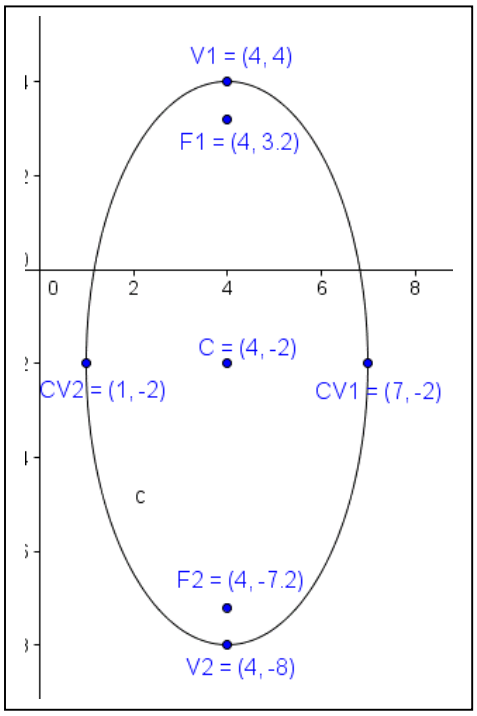
The values h and K control the position of the center of the ellipse. The a and b values are the distance from the center to the vertices (a) and co-vertices (b). in an ellipse a>b and if a is in the denominator of the x^2, then the ellipse is horizontal. If a is in the y^2 denominator, the ellipse is vertical.

Use the Dynamic Worksheet to help you to sketch a graph of each of the ellipses below. Show the location of the center, endpoints of major and minor axes.

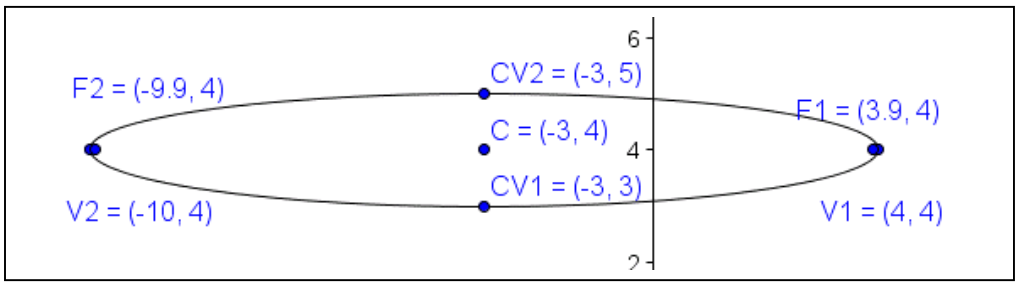
9. $\frac{x^2}{25}+\frac{(y+1)^2}{4}=1$



10. $\frac{(x-4)^2}{9}+\frac{(y+2)^2}{36}=1$



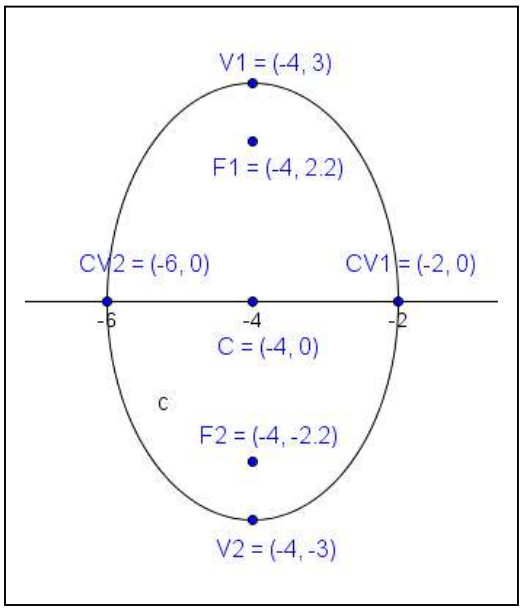
11. $\frac{(x+3)^2}{49}+(y-4)^2=1$

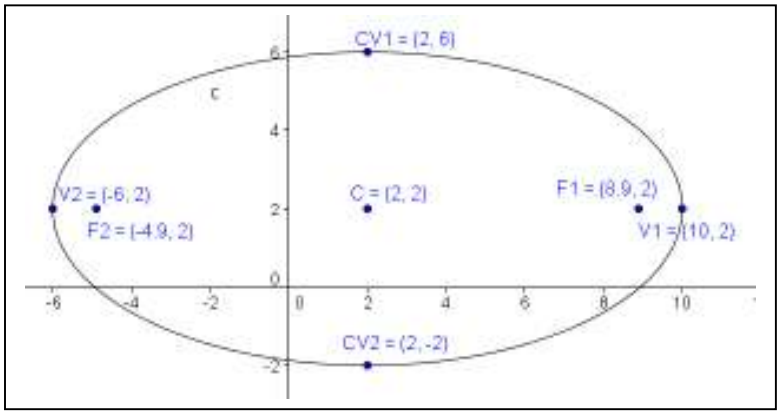


Graph each ellipse below without using the Dynamic Worksheet.

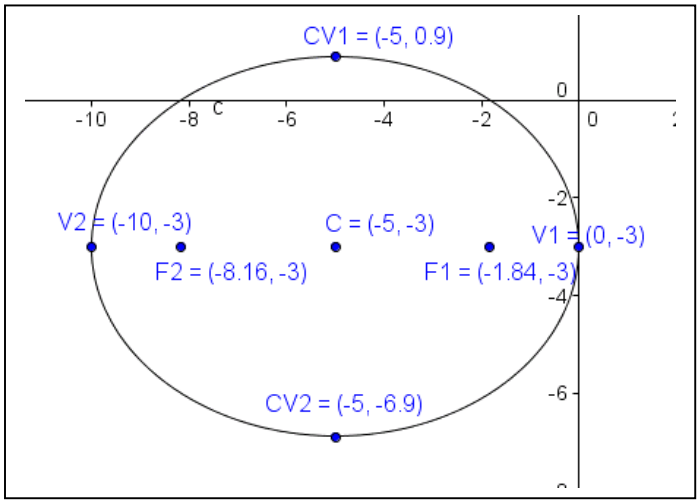
12. $\frac{(x+4)^2}{4}+\frac{y^2}{9}=1$

13. $\frac{(x-2)^2}{64}+\frac{(y-2)^2}{16}=1$





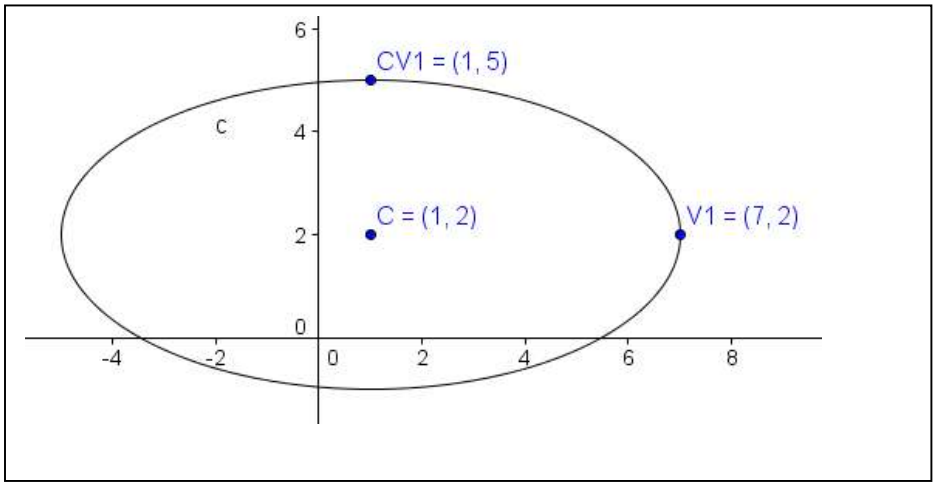
14. $\frac{(x+5)^2}{25}+\frac{(y+3)^2}{15}=1$



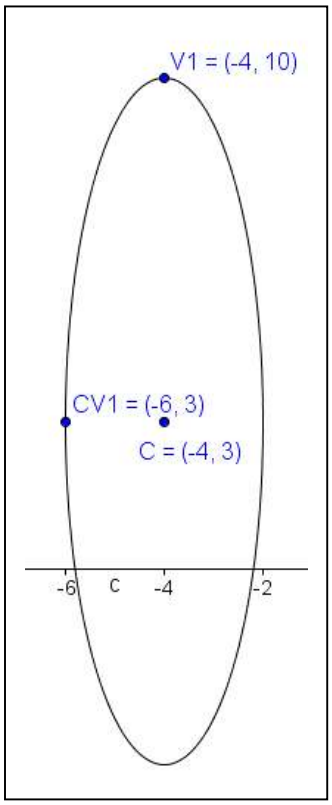
Write the equation for each ellipse shown below.

15.

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



16. $\frac{(x+4)^2}{4}+\frac{(y-3)^2}{49}=1$



17. $\frac{(x-1)^2}{36}+(y-3)^2=1$