

GeoGebra Dynamic Worksheet: Ellipse 1

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 computer dynamic worksheet)
 2. What is the orientation (horizontal or vertical) of the ellipse?
 3. Write the coordinates of:
 - i. the center
 - ii. the endpoints of the major axis
 - iii. the endpoints of the minor axis

- Set $h = 0$, $k = 0$, $a = 3$, $b = 2$.
 4. Write the equation for this ellipse.
 5. What is the orientation (horizontal or vertical) of the ellipse?
 6. Write the coordinates of:
 - i. the center
 - ii. the endpoints of the major axis
 - iii. the endpoints of the minor axis

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

7. Write the equation for this ellipse.

8. Write the coordinates of:

- the center
- the endpoints of the major axis
- the endpoints of the minor axis

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

9. Write the equation for this ellipse.

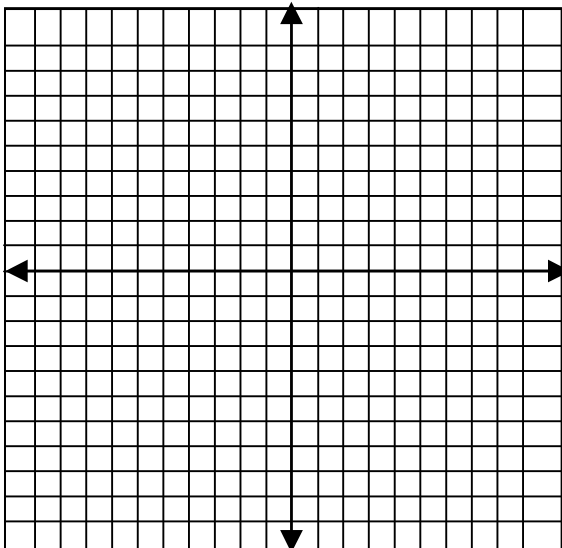
10. Write the coordinates of:

- the center
- the endpoints of the major and minor axis

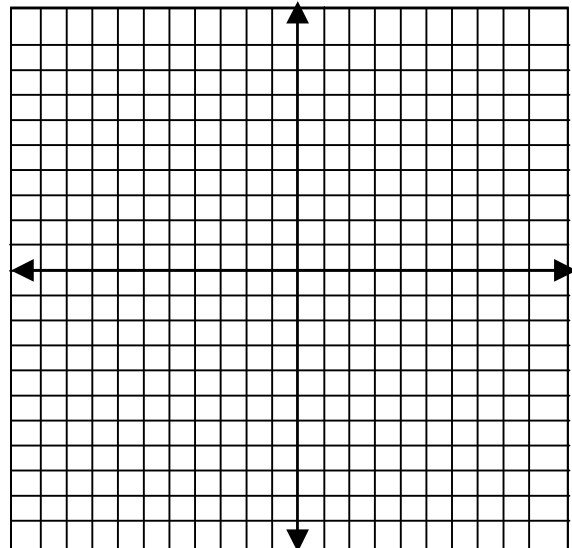
- Summarize how changing the value of h and k , a and b in the equation affects the graph of the ellipse. Include any effects on the center, major and minor axes.

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.

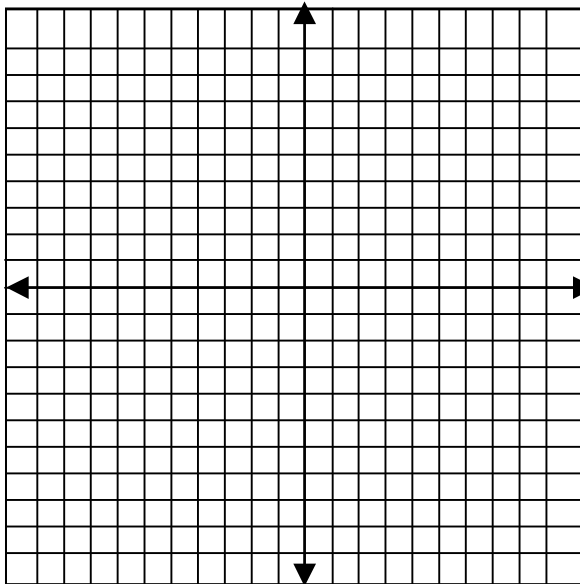
9. $\frac{x^2}{25} + \frac{(y+1)^2}{4} = 1$



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

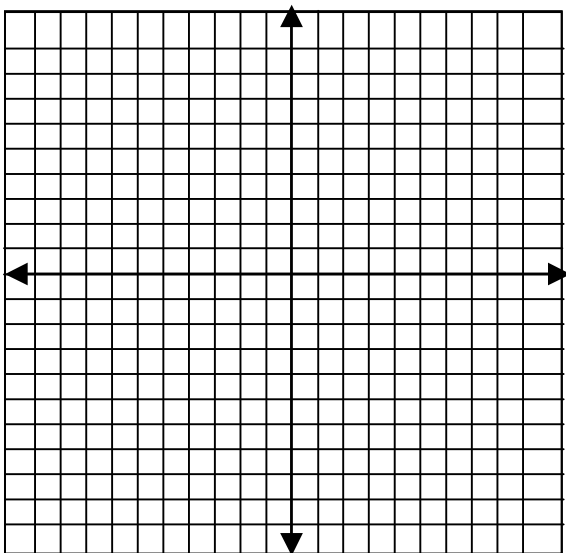


$$11. \frac{(x+3)^2}{49} + (y-4)^2 = 1$$

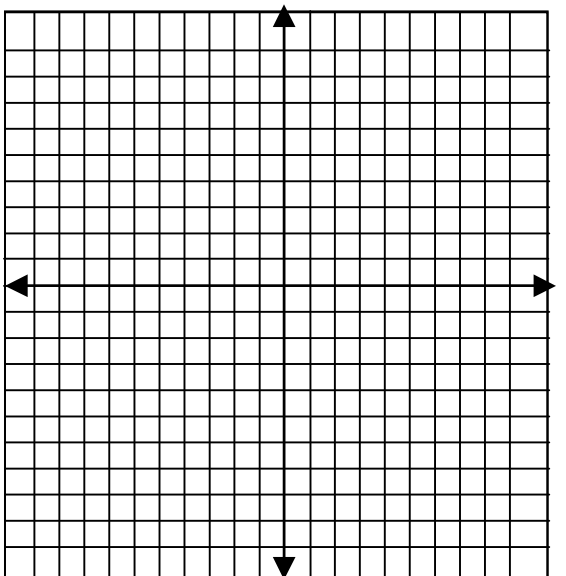
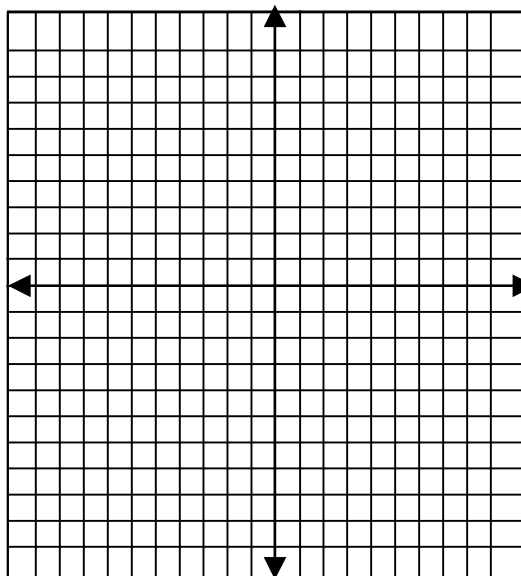


Graph each ellipse below without using the Dynamic Worksheet.

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



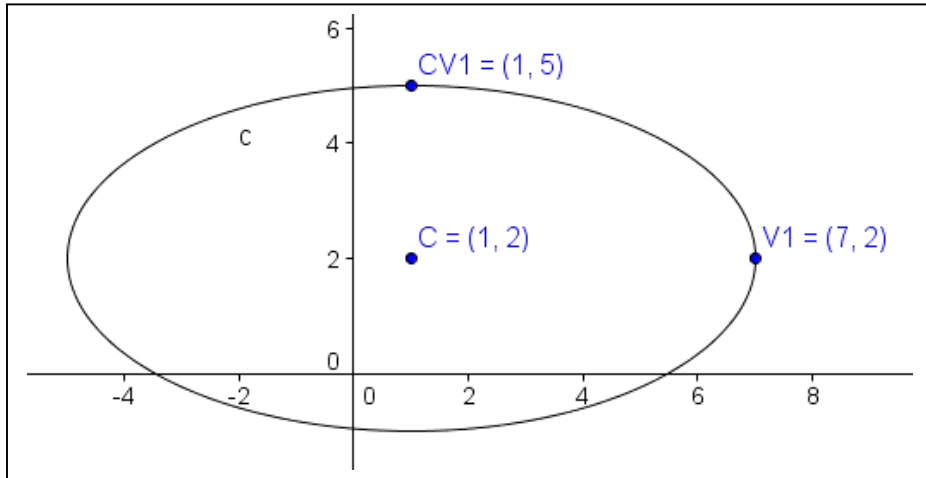
$$13. \frac{(x-2)^2}{64} + \frac{(y-2)^2}{16} = 1$$



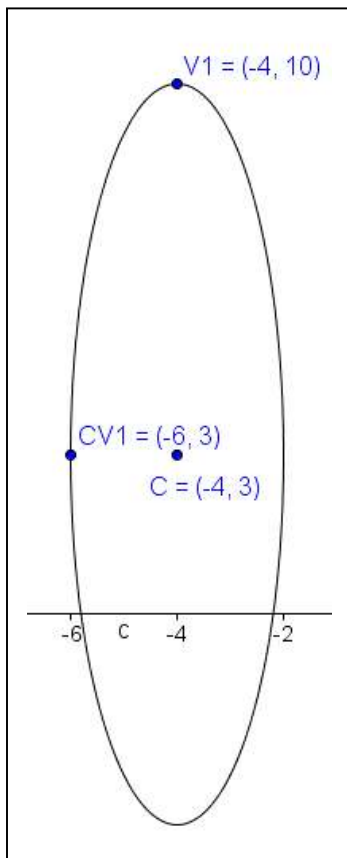
$$14. \frac{(x+5)^2}{25} + \frac{(y+3)^2}{15} = 1$$

Write the equation for each ellipse shown below.

15.



16.



17.

