

GeoGebra Dynamic Worksheet: Parabolas 1

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

$$y - k = \frac{1}{4p}(x - h)^2$$

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

- Start with $h=0$, $k=0$ and $p=2$.
 1. Write the equation of this parabola using the form above.
 2. Write the equation of the directrix, coordinates of the vertex and focus.

- Set $h=2$, $k=0$, $p=2$.
 3. Write the equation for this parabola.
 4. Write the equation of the directrix, coordinates of the vertex and focus.

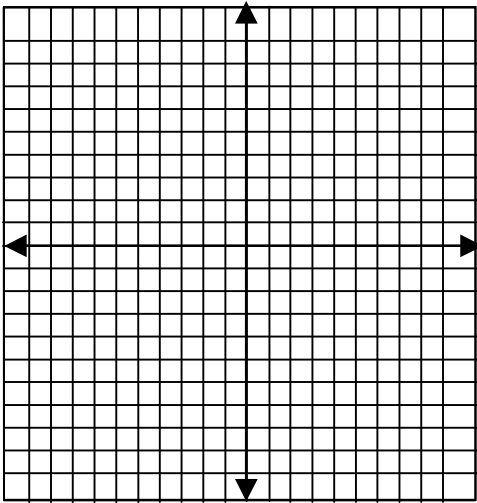
- Set $h=2$, $k=3$, $p=2$.
 5. Write the equation for this parabola.
 6. Write the equation of the directrix and the coordinates of the focus.

- Set $h=-2$, $k=-1$, $p=2$.
 7. Write the equation for this parabola.
 8. Write the equation of the directrix, coordinates of the vertex and focus.

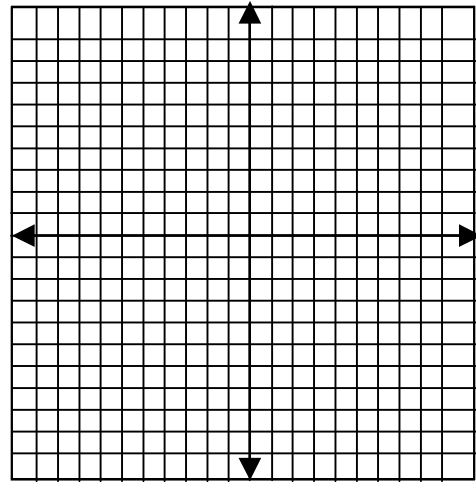
- Summarize how changing the value of h and k in the equation affects the graph of the parabola. Include any effects on the vertex, focus and directrix.
- Set $h = 0$, $k = 0$, $p = 2$. Move slider p and note the changes in the graph. Summarize what happens to the graph as p gets larger. What happens when p becomes negative?

Use the Dynamic Worksheet to help you to sketch a graph of each of the parabolas below. Show the location of the vertex, focus and directrix.

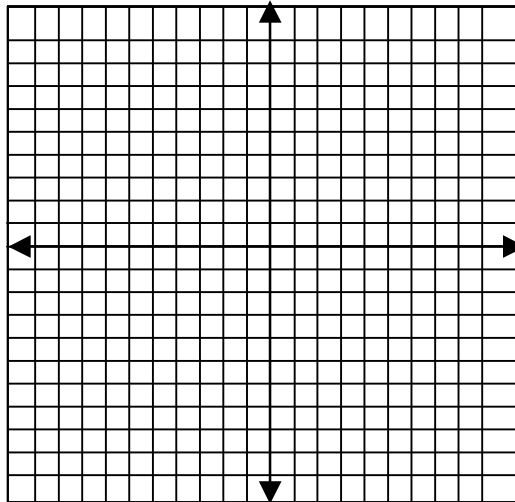
9. $y - 4 = \frac{1}{16}x^2$



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



11. $y + 1 = -\frac{1}{4}(x - 5)^2$

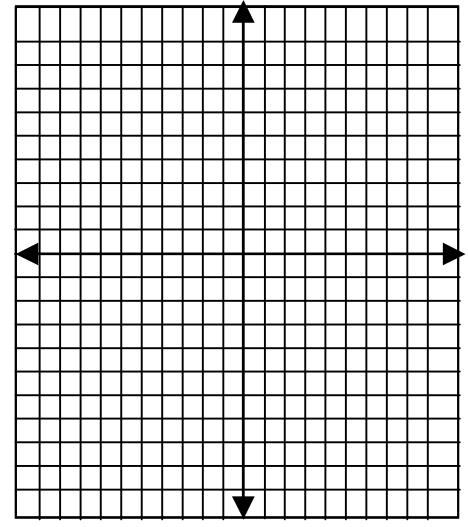
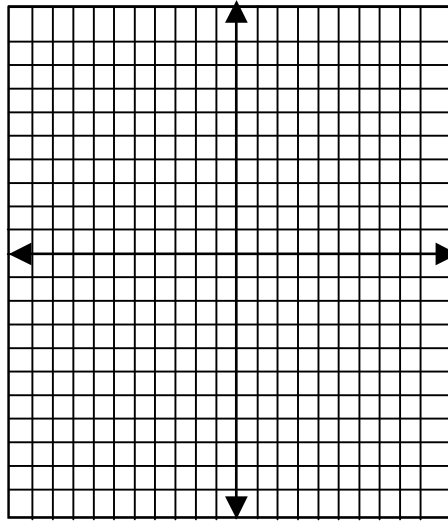
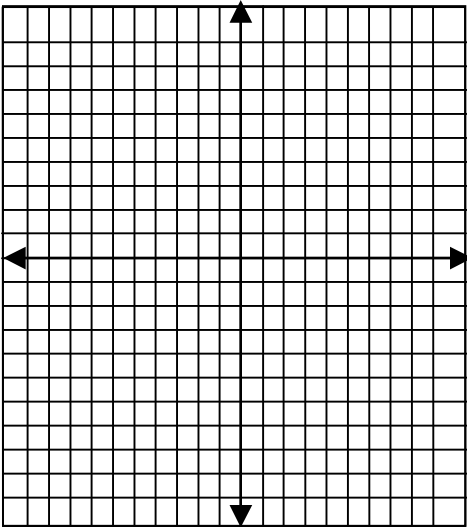


Graph each parabola below without using the Dynamic Worksheet.

12. $y - 1 = 2x^2$

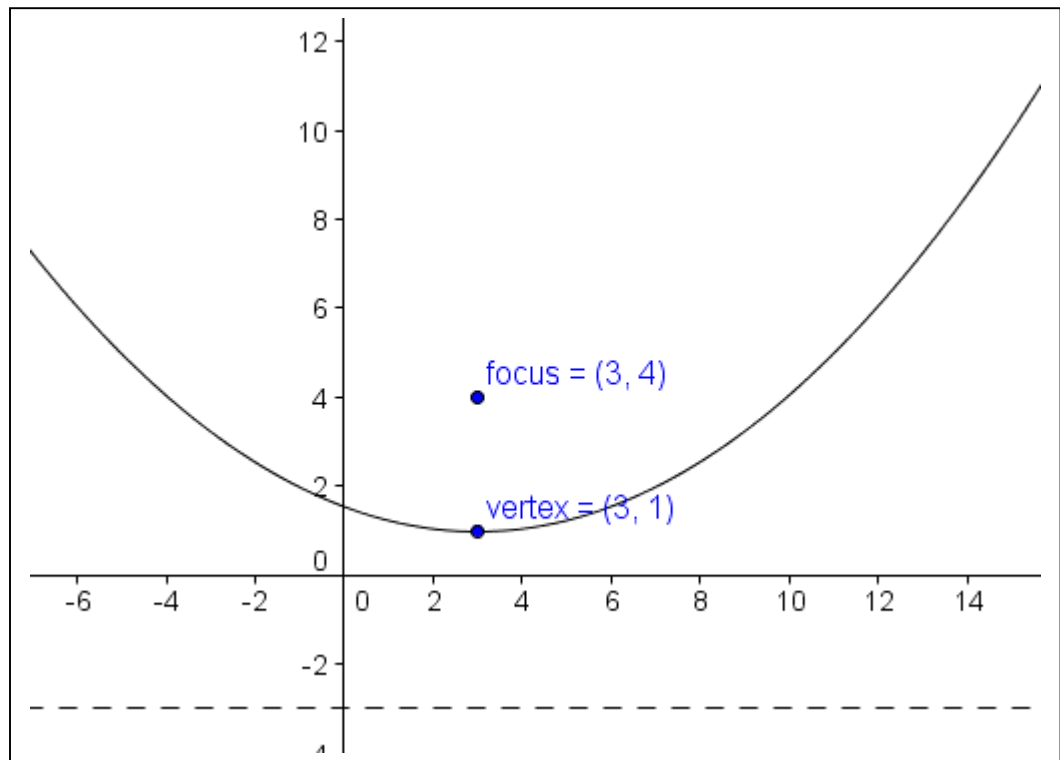
13. $y = \frac{1}{12}(x - 6)^2$

14. $y + 7 = \frac{1}{24}(x + 9)^2$

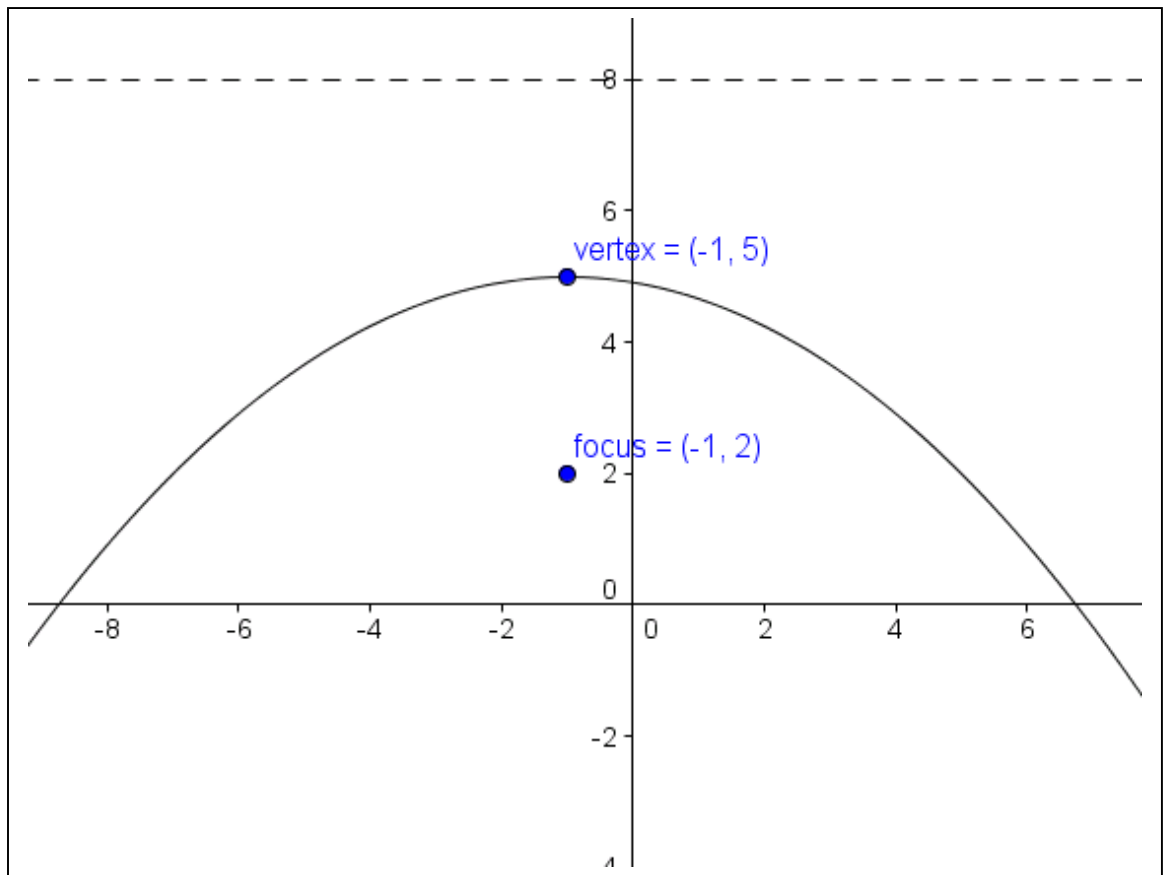


Write the equation for each parabola shown below.

15.



16.



17.

