

Name: _____

Period: _____

Parabolas

Goal:

- Graph a parabola given the standard form of the equation.
- Identify Vertex, Focus, Directrix, and Axis of symmetry given the equation

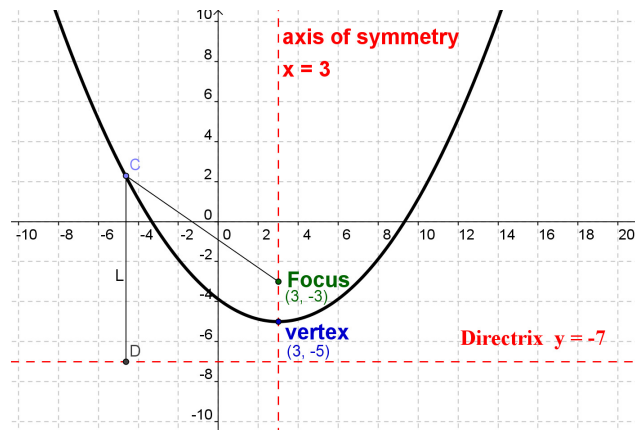
Log onto www.mrdealshomepage.com and experiment with the two Geogebra sketches in order to answer questions 1 and 2

Definition: The set of all points (x, y) that are equal distance from a point (Focus) and a line (directrix).

Standard Equation: $(x - h)^2 = 4(p)(y - k)$ or $(y - k)^2 = 4(p)(x - h)$

1. In the 2nd sketch title dynamic parabolas, what occurs when you change the sign of the p slider?
2. How are the focus and directrix related?

The equation for the parabola shown to the right is $(x - 3)^2 = 4(2)(y + 5)$

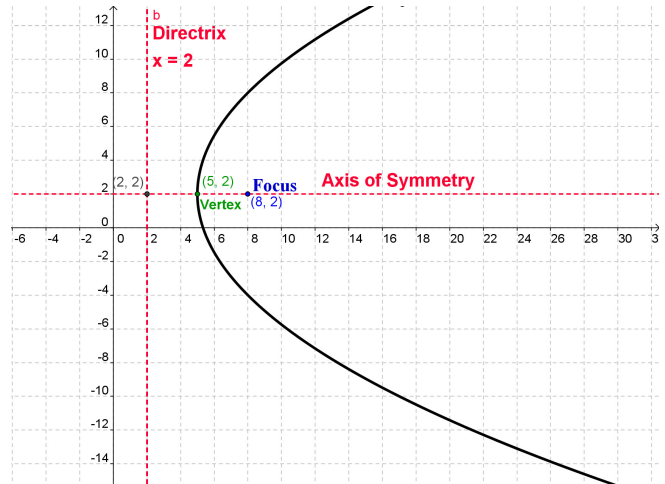


3. Based on the example to the right, what do you think the values h and k relate to in the graph?
4. Based on the definition of a parabola written above, what must be true about point C?
5. The variable p is shown in the standard form equation. Based on the graph, describe how to find the value of p given the graph of a parabola.

Name: _____

Period: _____

6. The parabola shown to the right has the equation $(y - 2)^2 = 4(3)(x - 5)$. Compare and contrast this parabola graph and equation with the parabola and equation form number .



7. Describe how to quickly determine if an equation represents a conic section that is a parabola, ellipse, hyperbola, or circle.
8. Find the coordinates of the vertex and focus, and the equations of the directrix and axis of symmetry. Then graph the equation given that $(x)^2 = -4(y - 3)$

Vertex:

Focus:

Axis of symmetry:

Directrix Axis:



Name: _____

Period: _____

9. Write the equation of the parabola that contains a vertex at the point $(-5, 1)$ and a focus at $(2, 1)$. Use the graph paper to assist you if necessary.



10. Write the equation of the parabola that contains a focus at $(4, -1)$ and the equation of the directrix is $y = -5$. Use the graph paper to assist you if necessary.



Name: _____

Period: _____

11. Find the coordinates of the vertex and focus, and the equations of the directrix and axis of symmetry. Then graph the equation given that $y^2 - 2x + 14y = -41$

Vertex:

Focus:

Axis of symmetry:

Directrix Axis:



12. A parabola has a vertical axis and passes through the point $(1, -7)$, $(5, -3)$, and $(7, -4)$. Determine the equation of the parabola.