Name: _____ Date: _____

BLM 4–10

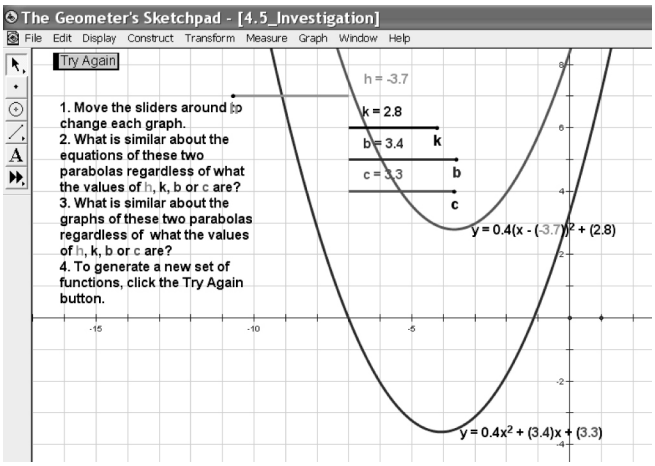
Section 4.5 Investigate

Tools

- computers
- *The Geometer's Sketchpad*®
- 4.5 Investigation.gsp

How do the graphs of $y = ax^2 + bx + c$ and $y = a(x - h)^2 + k$ compare?

1. Open the sketch **4.5 Investigation.gsp**.



2. In this sketch there are two parabolas, one represented by an equation of the form $y = ax^2 + bx + c$, and the other represented by an equation in vertex form, $y = a(x - h)^2 + k$. Move the four sliders to change their positions.

3. As you move the sliders, what do you notice about the two equations?

4. As you move the sliders, what do you notice about the two graphs?

5. For which graph is it easier to control the position of the parabola?

6. Click **Try Again** to see if this is true with a different set of parabolas.

7. Reflect Suppose you know the equation of the blue (lower) parabola is $y = 3x^2 + 9x - 8$ and the coordinates of the vertex of the red (upper) parabola are $(6, -2)$. Do you have enough information to write the vertex form of the equation for the red parabola? Explain your answer.