**Exploring Parameters with Geometer’s Sketchpad**

Recall the **standard form** of a quadratic function $f\left(x\right)=ax^{2}+bx+c$. In the Geometer’s Sketchpad file for Standard Form, parameters *a*, *b*, and *c* each have sliders at the bottom of the first sketch. Drag each parameter to the right to increase the value or to the left to decrease the value.

Looking at Tab 1, describe how changing the following parameters affect the graph.

1) Increasing *a*?

2) Decreasing *a*?

3) *a* > 0?

4) *a* < 0?

5) *a* = 0? Why do you think this happens?

6) Increasing *c*?

7) Decreasing *c*?

8) Which part of a quadratic graph is always represented by the *c* parameter? Can you explain why this is so?

Now, select the other tabs at the bottom of the file and see if you can match the purple graph to the red graph by changing the parameters.

Recall the **vertex form** of a quadratic function $f\left(x\right)=a(x-h)^{2}+k.$ In the Geometer’s Sketchpad file for Vertex Form, parameters *a*, *h*, and *k* each have sliders at the bottom of the first sketch. Drag each parameter to the right to increase the value or to the left to decrease the value.

Looking at Tab 1, describe how changing the following parameters affect the graph.

1) Increasing *a*?

2) Decreasing *a*?

3) *a* > 0?

4) *a* < 0?

5) Increasing *h*?

6) Decreasing *h*?

7) Increasing *k*?

8) Decreasing *k*?

Now select the other tabs at the bottom of the file and see if you can match the purple graph to the red graph by changing the parameters.