Name _____ Date _____ Score _____

Graphing Calculator Investigation – Quadratics in Vertex Form

Using $y = a(x - h)^2 + k$ – consider the following questions:

1. How does changing the value of h affect the graph? Consider the following as examples.

$y = 2(x - 5)^2 - 7$ $y = 2(x - 3)^2 - 7$ $y = 2(x + 2)^2 - 7$ $y = 2(x + 6)^2 - 7$

- Moves graph left or right

$h > 0$ translate to the right
$h < 0$ translate to the left

2. How does changing the value of k affect the graph? Consider the following as examples.

$y = 2(x - 5)^2 - 7$ $y = 2(x - 5)^2 - 3$ $y = 2(x - 5)^2 + 1$ $y = 2(x - 5)^2 + 4$

- Moves graph up or down

$K > 0$ moves upward
$K < 0$ translate downward

3. How does changing the value of a affect the graph? Consider the following as examples.

$y = \frac{1}{2}(x - 5)^2 - 7$ $y = 2(x - 5)^2 - 7$ $y = 4(x - 5)^2 - 7$ $y = 10(x - 5)^2 - 7$

Makes graph wider or narrower

→ the smaller value of a then the wider the graph

4. How does using -a instead of a affect the graph? Give an example and explain.

If $-a$ is used the graph is reflected over the x-axis, If a is positive the graph opens upward and If a is negative it will open downward