MTH 95 Tech Lab 2 - Quadratic Graphs

Name:_____

1. In this technology lab you are going parabolas in GeoGebra. To get started, create a GeoGebra account to save your work to by going to www.geogebra.org. Then go to the Graphing Calculator.
   **IMPORTANT: Save your work in GeoGebra as you go so as to not accidentally lose your progress!**

2. Begin by creating three sliders. First type in $a = 1$, then in the next line type $h = 0$, and in the 3rd line type $k = 0$. This should give you three sliders to work with.

3. Now type in the vertex form of a quadratic function $f(x) = a(x - h)^2 + k$ so that you can play with the sliders to move the parabola around and stretch it.

4. Set $a = -2$, $h = 0.5$, and $k = 23.75$.

5. Determine the following: vertex, stretch factor, $y$-intercept, $x$-intercepts, axis of symmetry, $y$-intercept mirror point, domain, and range. Write them here.

6. Click on the three little dots next to $f(x)$ and create a table of values. List the 5 points nearest the vertex (including the vertex) in a table here.

7. Save this work **as a public file** (or I cannot see it) and write it here.

8. Open a new GeoGebra file to create another graph. Leave the first graph open in a separate tab as you'll compare them later.

9. Create three sliders. First type in $a = 1$, then in the next line type $b = 1$ and then in the 3rd line type $c = 1$.

10. Now type in the standard form for a quadratic function $f(x) = ax^2 + bx + c$ so that you can play with the sliders to move the parabola around and stretch it.
11. Take some time to play with the sliders. Describe the affect of each slider here.

    i. What does $a$ affect?

    ii. What does $b$ affect?

    iii. What does $c$ affect?

12. Do any of the sliders have the same affect as an of the sliders from your first geogebra graph?

13. Save this work **as a public file** (or I cannot see it) and write it here.

14. Open a new GeoGebra file to create another graph. Leave the first graph open in a separate tab as you'll compare them later.
15. Create three sliders. First type in $a = 1$, then in the next line type $p = 1$ and then in the 3rd line type $q = 2$.
16. Now type in the factored form for a quadratic function $f(x) = a(x - p)(x - q)$ so that you can play with the sliders to move the parabola around and stretch it.
17. Take some time to play with the sliders. Describe the affect of each slider here.

    i. What does $a$ affect?

    ii. What does $p$ affect?

iii. What does $q$ affect?

18. Do any of the sliders have the same affect as an of the sliders from your first geogebra graph?

19. So far we have looked at factoring a quadratic function in standard form into its factored form. We could also multiply the factored form to get to the standard form. Can you get the vertex form from the first graph into standard and factored form? Give it a go here:

20. Our next goal is to go from standard form to vertex form! Bonus Question (5 pts) Find a formula the shows how to convert $h$ and $k$ into $b$ and $c$ or visa versa.

21. Save the GeoGebra graphs you've created **as a public file** (or I cannot see it) and write, as legibly as you possibly can, the link to your work here so that I can type it in to take a look.