**Translations of Parent Functions Project**  Name \_\_\_\_\_\_\_\_\_\_\_\_

In this activity, you will investigate translations of parent functions. You will observe how altering different parts of each parent function will affect its graph in a similar way.

Later, as a class, we will derive a formula that will make it easier to graph complex equations by relating them to their corresponding parent function.

*Here is a list of the parent functions we will be exploring:*

**Quadratic Function**

**Absolute Value Function**  (Hint: Use the ABS button)

**Cubic Function**

**Square Root Function**

1. To complete this activity you will need to go to www.desmo.com
2. Graph the four parent functions above.
3. First, let’s explore what happens if you place a coefficient in front of your parent function,

(i.e. you multiply your parent function by different positive integers)

1. Graph the following examples for each parent function:
2. Test more positive coefficients (or positive values for **a**) to gather more data.
3. What are your observations? How is the parent function affected by introducing a coefficient? What do you notice when ? What do you notice when ?
4. Let’s explore what happens if you place a negative coefficient in front of your parent function, (i.e. you multiply your parent function by different negative rational numbers)
5. Graph the following examples:
6. What are your observations? How is the parent function affected by introducing a negative coefficient?
7. What do the graphs of and have in common? What about and ? and ?
8. Let’s explore what happens when you add or subtract different integers into the input of the parent function, (i.e. you add or subtract different integers outside your parent function).
9. Graph the following examples:
10. Test more values for **k** to gather more data.
11. What are your observations? What happens when you add an integer outside the parent function?
12. What happens to the original graph of when you subtract an integer outside the parent function?
13. Let’s explore what happens when you add or subtract different integers into the input of the parent function, (i.e. you add or subtract different integers inside your parent function).

Graph the following examples:

1. Test more values for **h** to gather more data.
2. What are your observations? What happens when you add an integer inside the parent function?
3. What happens to the original graph of when you subtract an integer inside the parent function?
4. Lets see what happens when we combine everything together . What are you observations?