**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_\_\_**

**Transformation of Graphs**

There are five basic (“mother-function”) graphs that you must learn well this year.

Your next task will be to learn the different transformations that can impact these mother-function graphs.

We will use Desmos (have I told you how much I ♥ Desmos?) to do some initial investigation.

Follow these steps carefully:

1) open up Desmos (either the app or the website: www.desmos.com)  
2) launch the calculator  
3) type the function you wish to explore (see below) into the Input box.  
4) notice how you are given the option to “add slider” as you type in the letters “a”, “c”. and “d”. DO THIS (choose to add the three sliders)!!  
5) slide a to 1, c to 0, and d to 0  
6) \* we will not consider the “b” parameter today. We will discuss it next class, however \*  
7) a mother-function should show up on the grid (and you should be proud / excited)  
8) move the sliders (one at a time) to see what happens when you change the values of “a”, “c” and “d”

9) answer the questions on the back of this page

|  |  |  |
| --- | --- | --- |
| **Name of Function** | **Mother-Function** | **What to Enter into Desmos** |
| Quadratic Function |  | y = a (x – c)^2 + d |
| Cubic Function |  | y = a (x – c)^3 + d |
| Absolute Value Function |  | y = a (abs (x – c)) + d |
| Square Root Function |  | y = a (sqrt (x – c)) + d |
| Reciprocal Function |  | y = a (1/(x – c)) + d |

Give the domain and range of each of the Mother-Functions:

|  |  |  |
| --- | --- | --- |
| **Name of Function** | **Domain** | **Range** |
| Quadratic Function |  |  |
| Cubic Function |  |  |
| Absolute Value Function |  |  |
| Square Root Function |  |  |
| Reciprocal Function |  |  |

How and why is the domain of the mother-function square root function different from all the rest?

How and why is the domain of the mother-function reciprocal function different from all the rest?

In all the functions, what seems to be the impact (or impacts) of the following?

* a positive *c* value
* a negative *c* value
* a positive *d* value
* a negative *d* value
* a positive *a* value
* a negative *a* value
* an *a* value greater than 1
* an *a* value between 0 and 1