Math 3 **2.2 Parent Functions and Transformations** Unit 2

*EQ: What is a parent function? How do we apply transformations to parent functions?*

**Parent Functions:**

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Function | Graph | Parent Function | Graph |
| **Linear** **Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG | **Absolute Value Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG |
| **Quadratic** **Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG | **Square Root Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG |
| **Cubic** **Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG | **Cube Root** **Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG |
| **Reciprocal** **Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG | **Greatest Integer Function** | http://2.bp.blogspot.com/-GH3BVeBcL-Q/Uu6zhdBf0sI/AAAAAAAAApM/O5OdmBZsSb4/s1600/1.PNG |

**Transformations:**

|  |
| --- |
| **y = af(x-h)+k** |

* “a” value determines whether the graph has vertically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* “h” value determines whether the graph has shifted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* “k” value determines whether the graph has shifted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* –f(x) demonstrates a reflection across the \_\_\_\_\_\_\_\_\_ axis.
* f(–x) demonstrates a reflection across the \_\_\_\_\_\_\_\_\_ axis.

***Directions:*** State the parent function and the types of transformations. Then, graph the parent function and the transformed function on the graph below.

**Example 1:** y = (x – 3)2 + 2

**Example 2:** y = –|x – 3|

**Example 3:** y = 3x + 1



***Directions:*** Write the equation of the function with the given transformations.

1. Quadratic Function; reflection across the x-axis, left 3, down 2
2. Absolute Value Function; reflection across the y-axis, vertical stretch by 8
3. Square Root Function;right 7, up 9, vertical compression of ½