**Polynomial Parent Functions**

There are several parent functions, however, we will only focus on the \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ parent functions. You will \_\_\_\_\_\_\_ start with one of these graphs \_\_\_\_\_\_\_ graphing with transformations!

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When performing transformations, ORDER MATTERS! You must apply \_\_\_\_\_\_\_\_\_\_ and then any \_\_\_\_\_\_. (Think about it like order of operations, you have to do multiplication before you can do addition, etc.)

**Transformations:**

**f(x) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

where # is any \_\_\_\_\_\_\_ number.

**Vertical Reflection Across the X-Axis**

f(x) = \_(±x-c)#+d

* If the sign at the front of the function is negative, you have a reflection across the x-axis. So the portions of the graph that are \_\_\_, go \_\_\_\_\_, and the portions of the graph that are \_\_\_\_\_, go \_\_\_.

**Horizontal Reflection Across the Y-Axis**

f(x) = ±(\_x-c)#+d

* If the sign in front of "x" is negative, you have a reflection across the y-axis. So the portions of the graph that are \_\_\_\_\_, go \_\_\_\_\_, and the portions of the graph that are \_\_\_\_\_, go \_\_\_\_\_.

**Horizontal Shift**

f(x) = ±(±x-\_)#+d

* If c in the function is positive, HS \_\_\_\_\_ by \_\_\_\_.
* If c in the function is negative, HS \_\_\_\_\_by \_\_\_\_.

**Vertical Shift**

f(x) = ±(±x-c)#+\_

* If d in the function is positive, VS \_\_\_\_ by \_\_\_\_.
* If d in the function is negative, VS \_\_\_\_ by \_\_\_\_.

**Example: Identify the parent function for the polynomial below. Then describe the transformations.**

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| --- | --- | --- | --- | --- |
| **Parent Function:** | **Vertical Reflection?** | **Horizontal Reflection?** | **Horizontal Shift – Direction? How many?** | **Vertical Shift – Direction? How many?** |
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| --- | --- | --- | --- | --- |
| **Parent Function:** | **Vertical Reflection?** | **Horizontal Reflection?** | **Horizontal Shift – Direction? How many?** | **Vertical Shift – Direction? How many?** |
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| --- | --- | --- | --- | --- |
| **Parent Function:** | **Vertical Reflection?** | **Horizontal Reflection?** | **Horizontal Shift – Direction? How many?** | **Vertical Shift – Direction? How many?** |
|  |  |  |  |  |
| **Examples: Describe the transformations for the given function and then graph using transformations. Make sure to include the parent.** |
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| --- | --- | --- | --- | --- |
| **Parent Function:** | **Vertical Reflection?** | **Horizontal Reflection?** | **Horizontal Shift – Direction? How many?** | **Vertical Shift – Direction? How many?** |
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| --- | --- | --- | --- | --- |
| **Parent Function:** | **Vertical Reflection?** | **Horizontal Reflection?** | **Horizontal Shift – Direction? How many?** | **Vertical Shift – Direction? How many?** |
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