**Transformations:**



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - If \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - depends on the value of \_\_\_\_

* If \_\_\_\_\_\_\_\_\_\_\_\_\_ it shifts to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* If \_\_\_\_\_\_\_\_\_\_\_\_\_ it shifts to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - depends on the value of \_\_\_\_

* If \_\_\_\_\_\_\_\_\_\_\_\_\_ it shifts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* If \_\_\_\_\_\_\_\_\_\_\_\_\_ it shifts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example # 1: Describe the transformations for the function below.**



|  |  |  |
| --- | --- | --- |
| **Vertical Reflection?** | **Horizontal Shift: Direction? How many?** | **Vertical Shift: Direction? How many?** |
|  |  |  |

**Graphing:**

The graph of a rational function is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which has two separate branches.



**Steps to Graphing Rational Functions:**

1.) Find the \_\_\_\_\_\_\_\_\_\_\_\_.

2.) Identify and graph the \_\_\_\_\_\_\_\_\_\_\_.

3.) Create a \_\_\_\_\_\_\_\_\_\_ of values.

 \*You can use the table feature in your calculator.

\*Make sure to \_\_\_\_\_\_\_\_\_\_\_ your zeros as well as x-values on the left and right of each of them and the asymptotes...both positive and negative numbers!

4.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the points from your table.

5.) Connect with a smooth curve.

**Example # 2: Graph.**



We already determine that the ZEROS of the function are x = \_\_\_\_ and x = \_\_\_\_and the \_\_\_\_\_\_\_\_ ASYMPTOTE is \_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |
| --- | --- |
| **Table of Values:** | **Draw the asymptote(s), plot the points from your table, and connect your points with a smooth curve.**  |

**Example # 3: Graph**



We determined that the ZEROS of the function are x = \_\_\_\_ and the \_\_\_\_\_\_\_\_ ASYMPTOTE is \_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_ ASYMPTOTE is \_\_\_\_\_

|  |  |
| --- | --- |
| **Table of Values:** | **Draw the asymptote(s), plot the points from your table, and connect your points with a smooth curve.** |

**Example # 4: Identify the holes in the graph below. Then graph.**



We determined that the HOLE occurs at the point \_\_\_\_\_\_.

**To Graph Functions with Holes:**

*Depending on the remaining function, you can graph using a table of values or slope-intercept form.*

Our remaining function is f(x) = \_\_\_\_\_ which we know is the same as \_\_\_\_\_\_ so we can graph using slope intercept form.

Don't forget to leave a HOLE at the point \_\_\_\_\_\_\_!

|  |  |
| --- | --- |
| **Table of Values:** |  |