|  |  |  |
| --- | --- | --- |
| Transformation: | Notation: | Description: |
| Reflection |  | Vertical Reflection across the \_\_\_\_\_\_\_ |
|  | Horizontal Reflection across the \_\_\_\_\_\_\_ |
| Vertical Stretch | \*if \_\_\_\_\_\_\_\_\_\_\_\_\_ | Vertical Stretch by a factor of \_\_\_\_\_\_\_. |
| Vertical Shrink | \*if \_\_\_\_\_\_\_\_\_\_\_\_\_ | Vertical Shrink by a factor of \_\_\_\_. |
| Horizontal Stretch | \*if \_\_\_\_\_\_\_\_\_\_\_\_\_ | Horizontal Stretch by a factor of \_\_\_\_\_\_.  |
| Horizontal Shrink | \*if \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Horizontal Shrink by a factor of \_\_\_\_\_\_\_. |
| Horizontal Shift |  | Horizontal Shift \_\_\_\_\_ by \_\_\_\_\_\_\_\_. |
|  | Horizontal Shift \_\_\_\_\_ by \_\_\_\_\_\_\_\_. |
| Vertical Shift |  | Vertical Shift \_\_\_\_\_\_\_ by \_\_\_\_. |
|  | Vertical Shift \_\_\_\_\_\_\_\_\_ by \_\_\_\_. |

**Examples:** Identify the transformations for the functions below.









**Example:** Write the equation of an exponential function with a base of 8 that has been vertically reflected, vertically compressed by 1/3, horizontally shifted left 4, and vertically shifted up 2.

**Example:** Write the equation of an exponential function with a base of 2 that has been horizontally reflected, vertically stretched by 3, horizontally compressed by 1/2, and vertically shifted down 2.

**Steps to Graphing Exponential Functions:**

Step 1: Create the points (0, \_) and (1, \_\_).

Step 2: Identify & graph the asymptote (y = \_).

Step 3: Plot the points from Step 1 and move based on the transformations. Remember order matters!

Step 4: Connect the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with a smooth curve.

**Example:** Graph the function using transformations.

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**Example:** Graph the function using transformations.

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