Remember that **\_\_\_\_\_\_\_\_\_\_\_\_** are just **\_\_\_\_\_\_\_\_\_** of **\_\_\_\_\_\_\_\_\_\_\_\_\_**

functions, so many of their characteristics are just **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of one another.

**Characteristics of Logarithmic Functions**

* Domain = depends on the "\_\_\_\_\_\_\_" value

  \*If h is (+), then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*If h is (-), then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(We can \_\_\_\_\_\_\_\_\_\_ evaluate the log of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number so x must always be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!)**

* Range = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* X-Intercept - The point (#, 0). Use the TABLE feature on your calculator to determine. If the x-intercept does not appear in the table, calculate by \_\_\_\_\_\_\_\_\_\_\_\_. **THERE WILL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ BE AN X-INTERCEPT!**
* Y-Intercept - The point (0, #). Use the TABLE feature on your calculator to determine. If the y-intercept does not appear in the table, calculate by hand. When the vertical asymptote is \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_, **THERE IS \_\_\_\_\_\_\_\_\_\_ Y-INTERCEPT.**
* End Behavior:



**Because a log can never have be evaluated at a negative "of - value", h will be as far \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as the graph will go.**

* Interval of Increase or Decrease:

\*Increase - graph goes \_\_\_\_\_\_\_\_\_\_ from left to right.

\*Decrease - graph goes \_\_\_\_\_\_\_\_\_\_ from left to right.

**Remember to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ one!**

\*The interval will never change and will always be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Graphing Logarithmic Functions**

1.) Find the inverse of the log function (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ "h" and "k").

2.) Find your "starting exponential points" of (\_\_\_\_\_\_\_\_\_\_\_) and (\_\_\_\_\_\_\_\_\_\_\_\_).

3.) \_\_\_\_\_\_\_\_\_\_\_\_\_ the coordinates in each ordered pair (a,0) and (ab, 1). These will be the "\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_" of your logarithmic function!

4.) \_\_\_\_\_\_\_\_\_\_ your "starting \_\_\_\_\_\_\_\_\_\_ points" using "h" and "k."

\*If h is (+) move to the \_\_\_\_\_\_\_\_. If h is (-) move to the \_\_\_\_\_\_\_\_.

\*If k is (+) move \_\_\_\_\_\_\_\_. If k is (-) move \_\_\_\_\_\_\_\_\_\_.

5.) Draw the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ asymptote.

\*If h is (+), then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*If h is (-), then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.) Connect with a smooth curve.

**Example: Graph the function. Then identify the characteristics.**

|  |  |
| --- | --- |
|  | |
| Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_  X-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_  Y-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_  End Behavior:    Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |

**Example: Graph the function. Then identify the characteristics.**

|  |  |
| --- | --- |
|  | |
| Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_  X-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_  Y-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_  End Behavior:    Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |