***The inverse of an exponential function is a logarithmic function.***

* ***Example:*** Find the inverse of *f*(*x*) = 3*x*
* ***Example:*** Find the inverse of *g*(*x*) = log2 *x*

**Switch x and y values FIRST!**

* ***Example:*** Find the inverse of *f*(*x*) = 3 + log2 *x*
* ***Example:*** Find the inverse of *f*(*x*) = log2 (*x* + 1) – 3

Graphing Logarithmic Functions: ***Find the inverse; graph the inverse of the inverse…***

* ***Example:*** *f*(*x*) = 1 + log4 *x*
* ***Exponential Form:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **x** | **Exponential** | |  |  | |  |  | |  |  | |  |  | |  |  |   **Graph Only Logarithmic Table** | |  |  | | --- | --- | | **x** | **Logarithmic** | |  |  | |  |  | |  |  | |  |  | |  |  | |  |
| **Determine the following for Logarithmic functions:**   * Domain: * Range: * Vertical Asymptote: | **Find the following for the logarithmic function:**  *f*(*x*) = 1 + log4 *x*  ***Domain: \_\_\_\_\_\_\_\_\_\_***  ***Range: \_\_\_\_\_\_\_\_\_\_\_***  ***Asymptote:*** *\_\_\_\_\_\_\_\_\_\_* |  |

Graphing Logarithmic Functions: ***Find the inverse; graph the inverse of the inverse…***

* ***Example:*** Graph
* ***Exponential form:***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **x** | **Exponential** | |  |  | |  |  | |  |  | |  |  | |  |  |   **Graph Only Logarithmic Table** | |  |  | | --- | --- | | **x** | **Logarithmic** | |  |  | |  |  | |  |  | |  |  | |  |  | |  |
| **Determine the following for Logarithmic functions:**   * Domain: * Range: * Vertical Asymptote: | **Find the following for the logarithmic function:**  ***Domain: \_\_\_\_\_\_\_\_\_\_***  ***Range: \_\_\_\_\_\_\_\_\_\_\_***  ***Asymptote:*** *\_\_\_\_\_\_\_\_\_\_* |  |

***Finding x and y intercepts of a logarithmic function algebraically. ~Do NOT switch x and y~***

|  |  |
| --- | --- |
| * ***Example:*** *f*(*x*) = 1 + log4 *x*   *\*First write the logarithmic function in exponential form.\**   * ***Exponential form:*** | * ***Example:***   *\*First write the logarithmic function in exponential form.\**   * ***Exponential form:*** |
| ***Finding x – intercept:*** (Substitute 0 in for y) | ***Finding x – intercept:*** (Substitute 0 in for y) |
| ***Finding y – intercept:*** (Substitute 0 in for x) | ***Finding y – intercept:*** (Substitute 0 in for x) |