A ***Logarithm*** is an\_\_\_\_\_EXPONENT\_\_\_\_\_

Logarithms are the inverse function of \_\_\_\_\_\_\_\_\_EXPONENTIAL FUNCTION\_\_\_\_\_\_\_\_\_.

To find an inverse we must first switch \_\_\_\_\_X AND Y\_\_\_\_\_\_ then solve for \_\_\_\_Y\_\_\_\_.

Use a logarithm to find the inverse of the following function

In words this expression means\_\_\_\_Y IS THE EXPONENT 0N BASE TWO NEEDED TO GET X\_\_\_\_\_\_.

Now substitute the word "Logarithm" for "Exponent" and we get

­­­­­­­­­­­­­­

\_\_\_\_\_\_\_\_ Y IS THE LOGARITHM 0N BASE TWO NEEDED TO GET X \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

And is written mathematically as \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Definition:

Logarithms with base 10 are called \_\_\_\_\_\_\_COMMON LOGARITHMS\_\_\_\_\_\_\_\_\_\_,

And are denoted\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Logarithms whit base are called \_\_\_\_\_\_\_\_ NATURAL LOGARITHMS \_\_\_\_\_\_\_\_\_\_,

And are denoted\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Examples:

1. Write in exponential form.

2. Write in logarithmic form.

3. Solve for .

4. Solve for .

Graph

|  |  |
| --- | --- |
| x | y 1 |
|  1/4  | -2  |
|  1/2  | -1  |
| 1  | 0  |
| 2  | 1  |
| 4  | 2  |
| 8  | 3  |

How does this graph Compare to

|  |  |
| --- | --- |
| x | y 2 |
|  1/27  | -3  |
|  1/9  | -2  |
|  1/3  | -1  |
| 1  | 0  |
| 3  | 1  |
| 9  | 2  |

|  |  |
| --- | --- |
| x | y 3 |
| 8  | -3  |
| 4  | -2  |
| 2  | -1  |
| 1  | 0  |
|  1/2  | 1  |
|  1/4  | 2  |

Six characteristics of a logarithmic function of the form, this includes the common and natural logs.

**1.**

**2.**

**3.**

**4.**

**5.**

**6.**

Natural Logarithmic Function: asymptotic

Definition:



This is the graph of the natural log function. Notice how it contains the six characteristics of listed above.

Historical note:

The number is an important mathematical constant irrational number like . The number is defined as