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

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\_\_\_\_\_\_\_\_ 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