Common - Logarithms

Definition: ***Common*** **Logarithms are Powers or Exponents of (10)**

Examples:	…	10^{-3}	10^{-2}	10^{-1}	10^{0}	10^{+1}	10^{+2}	10^{+3} …
Values:	…	.001	.01	.1	1	10	100	1000 …

The study of common logarithms is beneficial in the evaluation of Exponential and Logarithmic expressions as well as the solution of Exponential and Logarithmic Equations. Many times in Advanced Mathematics such expressions and equations do arise and students need understand and to be able to compute these topics.

Logarithmic Formulas

The log of a *Number* equals an *Exponent*. **The antilog of an Exponent equals a Number.**

$\text{Log}_B N = E$	$B^E = N$	$\text{Anti}_B E = N$
$\text{Log}_{10} 100 = 2$	$10^2 = 100$	$\text{Anti}_{10} 2 = 100$

Common Logarithms are relatively easy to understand and to compute when they are Integer Values: … -3, -2, -1, 0, +1, +2, +3, … However, many times they are not.

Using a Scientific Calculator makes the evaluation of non-integer exponents rather easy but only if a student really *understand* the above definitions *and* examples.

An Online Scientific Calculator and Plotter is available: CoolMath.com

An Online Table of Logarithmic: Common/Natural Logarithm Tables

It is useful for understanding the process of evaluation of non-integer exponents to be able to complete the following interpolation process used in the good ole days.

Interpolation (Estimation) Process

Determine the Value of X for .006! **Extimate of X is ????…** **Why?**

10^{-3}	10^{x}	10^{-2}	###	-3	X	-2	Think Table!
.001	.006	.01	###	.001	.006	.010	& Proportions!

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The Graph of 10^x in Black asymptotic to X axis *and moving upward.*
The Graph of Log(x) in Purple asymptotic to Y axis *and moving downward.*
Asymptotic*:** Describing an activity of a line ***approaching, but never reaching, a given value. (**Asymptote**)

Graph of Base (e) and Natural Logarithm by gCalcD
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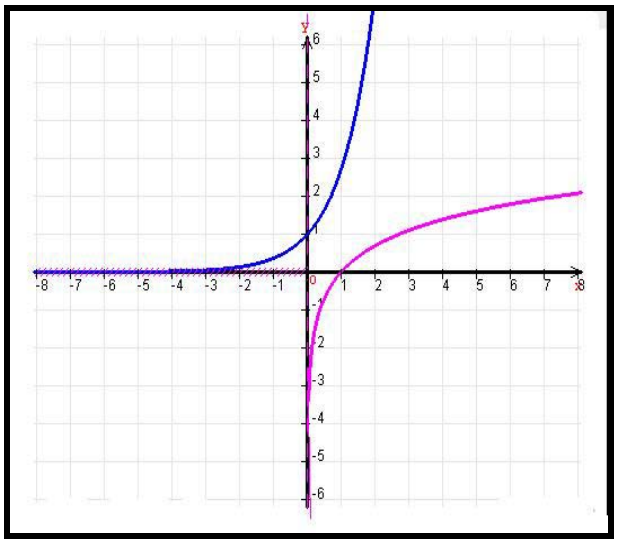
The Graph of e^x in Blue asymptotic to X axis *and moving upward.*
The Graph of Ln(x) in Purple asymptotic to Y axis *and moving downward.*
Asymptotic*:** Describing an activity of a line ***approaching, but never reaching, a given value. (**Asymptote**)



Graph of Base (e) and Natural Logarithm by gCalcD
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Natural - Logarithms

Definition: ***Natural*** **Logarithms are Powers or Exponents of e = 2.71828**

Examples:	…	e^{-3}	e^{-2}	e^{-1}	e^{0}	e^{+1}	e^{+2}	e^{+3} …	
Values:	…	.05	.14	.37	1	27	7.39	20.10 …	**Hundredths!**

The study of Natural logarithms is beneficial in the evaluation of Exponential and Logarithmic expressions as well as the solution of Exponential and Logarithmic Equations. Many times in Advanced Mathematics such expressions and equations do arise and students need understand and to be able to compute these topics.

Natural Logarithmic Formulas

The log of a Number equals an Exponent. **The antilog of an Exponent equals a Number.**

$\text{Log}_B N = E$	$B^E = N$	$\text{Anti}_B E = N$	
$\text{Ln } 100 = 2$	$e^2 = 4.60$	$\text{Anti}_e 2 = 4.60$	**Hundredths!**

Natural Logarithms are relatively easy to understand and to compute when they are Integer Values: … -3, -2, -1, 0, +1, +2, +3, … However, many times they are not.

Using a Scientific Calculator makes the evaluation of non-interger exponents rather easy but only if a student really understand the above definitions and examples.

An Online Scientific Calculator and Plotter is available: CoolMath.com

An Online Table of Logarithmic: Common/Natural Logarithm Tables

It is useful for understanding the process of evaluation of non-integer exponents to be able to complete the following interpolation process used in the good ole days.

Interpolation (Estimation) Process

Determine the Value of X for .006! **Extimate of X is ????…** **Why?**

e^{-3}	e^{x}	e^{-2}	###	-3	X	-2	**Think Table!**
.05	.06	.14	###	.05	.06	.14	**& Proportions!**

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