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# LOGARITHM FUNCTION

Abdurashitov Raxmatullo Abduxamitovich
Xusenov Zikrillo Raxmatillo o'g'li
Adxamov Xasanboy Abdusalom o‘g‘li

| A B S T R A C T | K E Y W O R D S |
|---|---|
| This article provides information about the purpose and functions of the logarithm function | Logarithm, function, negative, positive, formula, number, equation |

## Introduction

The calculation of logarithms is called logarithmology. a, b values are valid in most cases, but there are also complex logorifms. Logarithms have their own characteristics, which are widely used to significantly simplify time-consuming calculations. In the transition to the" universe of logarithms", the number multiplication action is replaced by addition, while the division with the subtraction action is performed, and the raising and rooting of the level becomes multiplication and division by the level, respectively. LaPlace said of the invention of logarithms that "logarithms reduced the labor of a mathematician and doubled his life". The definition of logarithms and the table of their values (for trigonometric functions) was first published in 1614 by the Scottish mathematician John Nepiermus. Expanded and improved by other mathematicians.

Logarithmic tables were made and logarithmic lines were used. Logarithmic tables were widely used for scientific and engineering calculations for more than three centuries until the advent of electronic accounting machines and computers. Properties of logarithms: various properties of logarithms are often used when replacing expressions in which logarithms are involved, in computations, and in solving equations.

The concept of the logarithmic function and its graph. let a be the logarithm of X in base i.e. the logarithmic function is called, Where x is the argument, y is the function. By definition, y x a is the inverse function of a log function x Y is the inverse function to a function y x 3 is the graph of a log function and we check its properties.

1. y x 3 the defining domain of a function in the space of \ u200b \ u200bof the edge consists of the set of all positive numbers, since the space was 0 x a.
2. y x and 3, so that the graph of a function log in the cell lies to the right of the Y-axis (where the basis is a positive number) the negative numbers do not have a logarithm of zero.
3. the function is zero when x = 1.
4. y x 3 is a function grower of the word log.
5. and in x1 is positive.
6. where x is the key, the key is the key, and the key is the key, and the key is the key, and the key is the key.

7. log 3 3 / 1

The logarithm function, denoted "Log", is a mathematical function representing the inverse relation of the exponential. To obtain a given number, the anic basis bisects the exponent that must be raised. The logarithm function is defined as:

log (base b) (x) = y

Where" x "is the countable number of the logarithm," b "is the basis of the logarithm, and" y "is the exponent to which the basis must be raised to obtain" x".

Properties of the logarithm function include:

1. Logarithmic Identity: log(base b) b) = 1. This means that the base itself logarithm will always be equal to 1.
2. Logarithmic zero: log (base b) (0) is undefined because there is no exponent where "b" can be raised to obtain 0.
3. Variation of the base formula. If the logarithm is given by a base "b", it can be represented by another base " C " using the formula log(base b) (x) = log(base c) (x) / log(base c) (b). This is useful when another base is preferred for Computational or representative purposes.
4. Logarithmic laws: logarithmic laws are the rules governing the exchange and simplification of logarithmic expressions. These laws include product, receipt and contract laws:

Product law: log (base b) (xy) = log (base b) (x) + log (base b) (y
Quotient's law: log (base b) (x / y) = log (base b) (x) - log (base b) (y
Power law: log (base b) (x^y) = y \ log (base b) (x

The logarithm function has applications in various fields such as mathematics, science, finance, computer science, engineering. It is used in areas such as exponential growth/decay, solving equations involving exponential and logarithmic functions, analyzing data with exponential forms, understanding logarithmic scales in measurement.
It should be noted that the basis of the logarithm determines the scale of the resulting values. Most commonly used bases are 10 (log (base 10)), most counters have "log" and "e" (natural logarithm), and its base is listed as approximately 2.71828, "ln".
In proving the remaining properties of the logarithmic function, this basic logarithmic axiom is also used: a loga N = n (N > 0, a > 0, a.1.) (1) (1) the specialness a X = N is generated by placing x = logaN on the Equality. A log in which the variable is involved is only appropriate for the X = X equivalence X with values x > 0. at x ≤ 0, the expression x = x to a log also loses its meaning.
1) loga 1 = 0, because a 0 = 1;
2) loga a = 1, because a 1 = a; (c > 0, c ≠ 1).
3) loga (NM) = loga N + loga M .
4) loga $N$ $M$ = loga n-loga m .
5) logaN= logcN logc a (c > 0, c ≠ 1).

6) loga 1 $N$ = - logaN
7) log a $\beta$ n = 1 logaN logaN 8) loga N $\beta$ = $\beta$ logaN $\beta$is a real number.

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