

# Section 6 3 Logarithmic Functions

## Logarithmic Functions A

Logarithm As a single-variable function, the logarithm to base  $b$  is the inverse of exponentiation with base  $b$ . For example, the logarithm of 1000 to base 10 is 3, because 1000 is 10 to the 3rd power:  $1000 = 10^3 = 10 \times 10 \times 10$ . Logarithmic functions are the only continuous In mathematics, the logarithm of a number is the exponent by which another fixed value, the base, must be raised to produce that number. More generally, if  $x = by$ , then  $y$  is the logarithm of  $x$  to base  $b$ , written  $\log_b x$ , so  $\log_{10} 1000 = 3$ .  $\log(d)$  expresses a group isomorphism between positive reals under multiplication and reals under addition

$\frac{1}{\cos \theta} = \sec \theta$  Bessel functions are solutions to a particular type of ordinary differential equation:  $y'' + \frac{1}{x}y' + (1 - \frac{1}{x^2})y = 0$  except non-positive integers, and  $x$

List of logarithmic identities The following is a compilation of the notable of these, many of which are used for computational purposes. In mathematics, many logarithmic identities exist. The following is a compilation of the notable of these, many of which are used for computational purposes In mathematics, many logarithmic identities exist

$\Gamma(n) = (n-1)!$  is defined for all complex numbers  $z$   $\Gamma(z) \cos \pi z = \Gamma(1-z)$  Let  $X$  be a complex manifold,  $D \subset X$  a reduced divisor (a sum of distinct codimension-1 complex subspaces), and  $\omega$  a holomorphic  $p$ -form on  $X - D$ . If both  $\omega$  and  $d\omega$  have a pole of order at most 1 along  $D$ , then  $\omega$  is said to have a logarithmic pole along  $D$ .  $\omega$  is also known as a logarithmic  $p$ -form. The  $p$ -forms with log poles along  $D$  form a subsheaf of the... The logarithmic spiral is distinct from the Archimedean spiral in that the distances between the turnings of a logarithmic spiral increase in a geometric progression, whereas for an Archimedean spiral these distances are constant.

Trigonometric functions trigonometric functions (also called circular functions,

angle functions or goniometric functions) are real functions which relate an angle of a right-angled triangle to ratios of two side lengths. In mathematics, the trigonometric functions (also called circular functions, angle functions or goniometric functions) are real functions which relate an angle of a right-angled triangle to ratios of two side lengths. They are widely used in all sciences that are related to geometry, such as navigation, solid mechanics, celestial mechanics, geodesy, and many others. They are among the simplest periodic functions, and as such are also widely used for studying periodic phenomena through Fourier analysis.

exsec  $\theta$  –  $\theta$  d  $\theta$

**Logarithmic spiral** The first to describe a logarithmic spiral was Albrecht Dürer (1525) who called it an "eternal line" ("ewige Linie"). More than a century later, the curve was discussed by Descartes (1638), and later extensively investigated by Jacob Bernoulli, who called it *Spira mirabilis*, "the marvelous spiral". A logarithmic spiral, equiangular spiral, or growth spiral is a self-similar spiral curve that often appears in nature. The first to describe a logarithmic A logarithmic spiral, equiangular spiral, or growth spiral is a self-similar spiral curve that often appears in nature.

$\log_b a = \frac{\log a}{\log b}$  )  $\log_b a = \frac{\log a}{\log b}$   $\theta = \log_b a$  (  $\log_b a = \frac{\log a}{\log b}$  ,  $\log_b a = \frac{\log a}{\log b}$  The logarithm base 10 is called the decimal or common logarithm and is commonly used in science and engineering. The natural logarithm has the number  $e \approx 2.718$  as its base; its use is widespread in mathematics and physics because of its very simple derivative. The binary logarithm uses base 2 and is widely used in computer science, information... It was introduced in 1855 by American civil engineer Charles Haslett, who used it in conjunction with the existing versine function,

**L (complexity)** containing decision problems that can be solved by a deterministic Turing machine using a logarithmic amount of writable memory space. Logarithmic space is sufficient to hold a constant number of pointers into the input and a logarithmic number of Boolean flags, and many basic logspace algorithms use the memory in this way. Formally, the Turing In computational complexity theory, L (also known as LSPACE, LOGSPACE or DLOGSPACE) is the complexity class containing decision problems that can be solved by a deterministic Turing machine using a logarithmic amount of writable memory space. Formally, the Turing machine has two tapes, one of which encodes the input and can only be read, whereas the other tape has logarithmic size but can be written as well as read.

**Logarithmic form** The concept was introduced In algebraic geometry and the theory of complex manifolds, a logarithmic differential form is a differential form with poles of a certain kind. In short, logarithmic differentials have the

mildest possible singularities needed in order to give information about an open submanifold (the complement of the divisor of poles). (This idea is made precise by several versions of de Rham's theorem discussed below. geometry and the theory of complex manifolds, a logarithmic differential form is a differential form with poles of a certain kind. The concept was introduced by Pierre Deligne. )

The gamma function can be defined via a convergent improper integral for complex numbers...  $\Gamma(z) = \int_0^\infty t^{z-1} e^{-t} dt$  for  $\text{Re}(z) > 0$ .

3. Handbook of Mathematical Functions. - The external secant function (abbreviated exsecant, symbolized exsec) is a trigonometric function defined in terms of the secant function:  $\text{exsec}(\theta) = \sec(\theta) - 1$ . 147: Elementary Transcendental Functions Circular functions. In Abramowitz, Milton; Stegun, Irene A. (eds)

The trigonometric functions most widely used in modern mathematics are the sine, the cosine, and the tangent functions. Their reciprocals are respectively the cosecant, the secant, and the cotangent functions, which are less used. Each of these six trigonometric functions has a corresponding...

Derived by Daniel Bernoulli, the gamma function. } The logarithmic derivative of the gamma function is called the digamma function; higher derivatives are the polygamma functions.  $\psi(z) = \frac{\Gamma'(z)}{\Gamma(z)}$ . The analog of  $\ln$  in mathematics, the gamma function (represented by  $\Gamma$ , capital Greek letter gamma) is the most common extension of the factorial function to complex numbers

Section I) trigonometric tables. The versine of an angle is 1 minus its cosine.  $\text{versin}(\theta) = 1 - \cos(\theta)$ . There are several related functions, most notably the coversine and haversine. The latter, half a versine, is of particular importance in the haversine formula of navigation.  $\text{haversin}(\theta) = \frac{1 - \cos(\theta)}{2}$

The versine The versine or versed sine is a trigonometric function found in some of the earliest (Sanskrit Aryabhatia,. The versine or versed sine is a trigonometric function found in some of the earliest (Sanskrit Aryabhatia, Section I) trigonometric tables. dictionary

Bessel function They are named after the German astronomer and

mathematician Friedrich Bessel, who studied them systematically in 1824. Bessel functions are mathematical special functions that commonly appear in problems involving wave motion, heat conduction, and other physical phenomena. Bessel functions are mathematical special functions that commonly appear in problems involving wave motion, heat conduction, and other physical phenomena with circular symmetry or cylindrical symmetry.

$x^{\frac{1}{n}}$  for every positive integer  $n$ .

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