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Mathematics Library
Safety Manual

Version 8.0

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CHAPTER 1

Introduction

Contents

1.1 This document

1.1.1 Document identification

This document is identified by the unique number QMS3359 together with the version number 8.0.

1.1.2 Document purpose

This document accompanies the Mathematics Library and describes the constraints within which that product must be used to ensure that its certification is not invalidated. The application developer must read and understand the contents of this document and the limits it places on an application, before incorporating the Mathematics Library into a product.

The following information is contained in this document:

- Chapter 2 defines the environment in which the Mathematics Library MUST be used.
- Chapter 3 describes the restrictions that are placed on the use of the Mathematics Library within a system designed for certification under ISO 26262 or IEC 61508.

- Chapter 4 lists some recommendations that QNX Software Systems proposes for the use of the Mathematics Library within a system certified to ISO 26262 or IEC 61508.

1.2 Document audience

Use this manual if you are responsible for the development of a system and you intend to use the Mathematics Library as a component within your system.

This document is specifically aimed at the following staff:

1. system architects
2. application designers and programmers
3. safety assessors (either independent or within the application development team)
4. other members of the functional safety management team

1.3 Nomenclature

In the remainder of this document, the acronym `libm` is used to refer to the Mathematics Library.

When this document refers one of the standards given in table 1.1, unless otherwise specified, it is a reference to the issue defined in that table.

The symbols i and j are used interchangeably in this document to represent the unit vector in the imaginary direction.

Other acronyms and specialised terms are listed below.

Domain. Given a function $f : X \to Y$, then X is the domain of f.

Pole. This is used to define a singularity in a function: a value z for which

$$\lim_{x \to z} f(x) = \pm\infty$$

.

NaN. “Not a number” as defined in IEEE 754.

QSSL. QNX Software Systems Limited.

Subnormal Number. This is a floating point number whose absolute value is greater than zero, but which is so small that it cannot be represented with full precision in a system compliant to IEEE 754 (i.e., it is smaller than the smallest “normal” number). Examples of subnormal numbers are given on page 21.

Significant Digits. The definition of this term is that given in section 1.2 of *Accuracy and Stability of Numerical Algorithms* (second edition) by Nicholas J Higham (ISBN 978-0-898715-21-7). Effectively:

- The significant digits in a number are the first nonzero digit and all succeeding digits. Thus 1.7320 has five significant digits, while 0.0491 has only three.
- An approximation $\hat{x}$ to x has p correct significant digits if $\hat{x}$ and x round to the same number to p significant digits.

The key words “MUST", “MUST NOT", “REQUIRED", “SHALL", “SHALL NOT", “SHOULD", “SHOULD NOT", “RECOMMENDED", “MAY", and “OPTIONAL" used within chapters 3 and 4 are to be interpreted as described in RFC 2119 and clarified in RFC8174 as published by the Internet Engineering Task Force (IETF) and available at http://www.rfc-editor.org/rfc/rfc2119.txt.

Standard	Version	Note
ISO 26262	2018	
IEC 61508	2010 incorporating 61508-3-1	
IEEE 754	2008	
ISO/IEC 9899	2011	Often known as “C11”

Table 1.1: Versions of Standards

1.4 Scope

This document refers to the `libm.so` and `libm-sve.so` versions of the `libm` that were released with the QNX OS for Safety 2.2. Note that `libmS.a` and `libm.a` are explicitly excluded.

CHAPTER 2

Assumed Environment

Contents

This chapter defines the environment within which it is assumed that the libm will be installed. It contains:

1. the boundary of the libm—see section *2.3*
2. the types of processor on which the libm may be executed—see section *2.4*

2.1 Safety Goal

The Mathematics Library, when used in accordance with the constraints given in chapter 3 of this document within the environment described in this chapter:

- meets the requirements of ISO 26262 for an element to be used in items at ASIL A, ASIL B, ASIL C or ASIL D.
- meets the requirements of IEC 61508 for a compliant item to be used in applications at SIL 1, SIL 2 or SIL 3.

2.2 Intent

The intent of the Mathematics Library is to provide a collection of mathematical functions in accordance with ISO/IEC 9899:2011 with predefined accuracy over a defined domain. These functions detect invalid inputs and respond in a predefined manner detectable by the invoking process.

2.3 Boundary of the certified product

The following functions and macros within the `libm` are defined in ISO/IEC 9899 and are covered by QSSL's certification process. Other functions and macros may be present in the `libm`, but these are not covered by the certification.

2.3.1 Real Functions

Trigonometric Functions

acos(), acosf(), acosl()

asin(), asinf(), asinl()

atan2(), atan2f(), atan2l()

atan(), atanf(), atanl()

cos(), cosf(), cosl()

sin(), sinf(), sinl()

tan(), tanf(), tanl()

Hyperbolic Functions

acosh(), acoshf(), acoshl()

asinh(), asinhf(), asinhl()

atanh(), atanhf(), atanhl()

cosh(), coshf(), coshl()

sinh(), sinhf(), sinhl()

tanh(), tanhf(), tanhl()

Logarithmic Functions

ilogb(), ilogbf(), ilogbl()

log10(), log10f(), log10l()

log1p(), log1pf(), log1pl()

log2(), log2f(), log2l()

logb(), logbf(), logbl()

log(), logf(), logl()

Comparison and Classification Functions

fmax(), fmaxf(), fmaxl()

fmin(), fminf(), fminl()

Rounding Functions

ceil(), ceilf(), ceill()

floor(), floorf(), floorl()

llrint(), llrintf(), llrintl()

llround(), llroundf(), llroundl()

lrint(), lrintf(), lrintl()

lround(), lroundf(), lroundl()

nearbyint(), nearbyintf(), nearbyintl()

nextafter(), nextafterf(), nextafterl()

nexttoward(), nexttowardf(), nexttowardl()

rint(), rintf(), rintl()

round(), roundf(), roundl()

trunc(), truncf(), truncl()

Statistical Functions

erfc(), erfcf(), erfcl()

erf(), erff(), erfl()

Power Functions

cbrt(), cbrtf(), cbrtl()

exp2(), exp2f(), exp2l()

expm1(), expm1f(), expm1l()

exp(), expf(), expl()

pow(), powf(), powl()

sqrt(), sqrtf(), sqrtl()

Gamma Functions

lgamma(), lgammaf(), lgammal()

tgamma(), tgammaf(), tgammal()

Remainder Functions

fmod(), fmodf(), fmodl()

modf(), modff(), modfl()

remainder(), remainderf(), remainderl()

remquo(), remquof(), remquol()

Miscellaneous Functions

copysign(), copysignf(), copysignl()

fabs(), fabsf(), fabsl()

fdim(), fdimf(), fdiml()

fma(), fmaf(), fmal()

frexp(), frexpf(), frexpl()

hypot(), hypotf(), hypotl()

ldexp(), ldexpf(), ldexpl()

nan(), nanf(), nanl()

scalbln(), scalblnf(), scalblnl()

scalbn(), scalbnf(), scalbnl()

2.3.2 Real Macros

Particular Values

HUGE_VAL

HUGE_VALF

HUGE_VALL

INFINITY

NAN

FP_INFINITE

FP_NAN

FP_NORMAL

FP_SUBNORMAL

FP_ZERO

FP_ILOGB0

FP_ILOGBNAN

MATH_ERREXCEPT

MATH_ERRNO

Comparison and Classification

math_errhandling

fpclassify()

isfinite()

isinf()

isnan()

isnormal()

signbit()

isgreater()

isgreaterequal()

isless()

islessequal()

islessgreater()

isunordered()

2.3.3 Complex Functions

Note that complex functions are certified for use exclusively with the `libm-sve.so` binary on the ARMv8.2 architecture.

Trigonometric Functions

cacos(), cacosl()

casin(), casinl()

catan(), catanl()

ccos(), ccosl()

csin(), csinl()

ctan(), ctanl()

Hyperbolic Functions

cacosh(), cacoshl()

casinh(), casinhl()

catanh(), catanhl()

ccosh(), ccoshl()

csinh(), csinhl()

ctanh(), ctanhl()

Exponential and Logarithmic Functions

cexp(), cexpl()

clog(), clogl()

Power and Absolute-Value Functions

cabs(), cabsl()

cpow(), cpowl()

csqrt(), csqrtl()

Manipulation Functions

carg(), cargl()

cimag(), cimagl()

conj(), conjl()

cproj(), cprojl()

creal(), creall()

2.3.4 Complex Macros

CMPLX

CMPLXL

2.4 Hardware assumptions

The `libm` is a software-only product and has the following hardware requirements in addition to those listed in the *QNX OS for Safety 2.2 Safety Manual*:

- `FLT_RADIX` = 2 and
- floating point arithmetic unit complying with IEEE 754 with the representations listed in table 2.1.

In practice, it is **very** unlikely that a processor would have `FLT_RADIX` not equal to 2, but this can be checked by executing the following program on the target machine:

```
#include <stdio.h>
#include <float.h>

int main()
    {
    printf("FLT_RADIX is %d\n", FLT_RADIX);
    return 0;
    }
```

Arch	float			double			long double		
	Size Octets	Mantissa Bits	Exp Bits	Size Octets	Mantissa Bits	Exp Bits	Size Octets	Mantissa Bits	Exp Bits
x86_64	4	24	8	8	53	11	16	64	15
aarch64	4	24	8	8	53	11	16	113	15

Table 2.1: Size of variables

The mantissa and exponent sizes can be found by executing a program such as the following.

```
#include <stdio.h>
#include <float.h>
#include <math.h>

int main()
    {
    printf("Mantissa float: %f\n", 1.0 - log(FLT_EPSILON) / log(2));
    printf("Mantissa double: %f\n", 1.0 - log(DBL_EPSILON) / log(2));
    printf("Mantissa long double: %f\n", 1.0 - log(LDBL_EPSILON) / log(2));
    printf("EXP bits FLT = %g\n", ceil(log2(FLT_MAX_EXP - FLT_MIN_EXP)));
    printf("EXP bits DBL = %g\n", ceil(log2(DBL_MAX_EXP - DBL_MIN_EXP)));
    printf("EXP bits LDBL = %g\n", ceil(log2(LDBL_MAX_EXP - LDBL_MIN_EXP)));
    return 0;
    }
```

2.5 Building the `libm`

The `libm` is shipped as a binary product requiring no building by the user.

CHAPTER 3

Restrictions

Contents

3.1 Introduction

The application developer SHALL read and understand the contents of this Safety Manual and the limits it places on any application using the Mathematics Library.

3.2 General Restrictions

Restriction 1. The user of the `libm` SHALL NOT redefine any of the symbols defined in the `libm` (including header files).

Thus, a user must not redefine `cos()` or any other of the functions and macros defined in the `libm`.

Restriction 2. No assumption SHALL be made about the timing of any library call.

Restriction 3. The user of the `libm` SHALL NOT assume that invoking a `libm` function that is not part of the certification exercise would not affect a subsequent invocation of any other function.

As stated in section 2.3, there are functions and macros in the `libm` in addition to those covered by the certification process and listed in section 2.3. These functions have not been thoroughly verified by QSSL and negative side-effects cannot be excluded.

3.3 Environmental Restrictions

3.3.1 Operating System

Restriction 4. The `libm` SHALL be executed only on the 64-bit version of the *QNX OS for Safety 2.2* operating system.

Restriction 15. Use of the `libm` SHALL comply with the *QNX OS for Safety 2.2* Safety Manual.

3.3.2 FPU Configuration

Correct operation of `libm` depends on correct configuration of the FPU, which is out of scope of the `libm` library.

Restriction 18. Before using the `libm`, the system SHALL verify that the FPU is correctly configured.

Strategies for FPU verification may include checking the configuration registers for known initial values or performing runtime diagnostics after startup.

A misconfigured FPU may affect the correctness or runtime of computations. For instance, misconfiguration could cause floating point emulation to be used instead of floating point hardware.

Some aspects of FPU configuration may be handled by startup routines prior to the start of QOS execution.

Restriction 21. No thread SHALL set the FPU into a Flush-to-Zero (FTZ) mode, Denormals-Are-Zero (DAZ) mode, nor the equivalent. This option may only be configured OFF by the Board Support Package (BSP) prior to starting the QOS.

3.4 Usage Restrictions

3.4.1 Error Handling

Restriction 5. The `libm` functions SHALL be accessed from application code only through interfaces published in the QSSL public documentation.

Restriction 6. The user of the `libm` SHALL check for errors flagged by a function by using `fetestexcept()`.

ISO/IEC 9899 allows a mathematics library to indicate error conditions either by setting `errno` or by raising an exception. The `libm` does not set `errno`, it raises an FP exception. See also recommendation 4.3 on page 18.

Restriction 7. The user of the `libm` SHALL use the QSSL documentation to determine which exceptions are raised by the functions in the `libm`.

The 2011 version of ISO/IEC 9899 uses the terms “may” or “implementation defined” in places to indicate that a mathematics library may, but need not, raise errors under certain circumstances.

For example, it is stated for:

```
remainder(123.4, 0.0)
```

that “whether a domain error occurs or the functions return zero is implementation defined.”

Similarly, for

```
lgamma(-3.0)
```

the standard says that: “A pole error may occur if x is a negative integer or zero.”

The definitive list of which errors are raised as exceptions is that given in QSSL’s library documentation.

3.4.2 Function Accuracy Exceptions

Restriction 8. The user of the `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the following functions: `acoshf()`, `asinhf()`, `atan2f()`, `atanf()`, `cbrtf()`, `coshf()`, `fabsf()`, `hypotf()`, `ldexpf()`, `powf()`, `sinhf()`, `tanf()`, `tanhf()` and `tgammaf()`.

For many functions within the `libm` there are three variants of the function: one with `float`, one with `double` and one with `long double` parameters and return values. For example:

```
float sinf(float x);
double sin(double x);
long double sinl(long double x);
```

Of these, the precision returned by the `float` version is often limited. In particular, domains were found during verification for the functions listed in restriction 3.4.2 for which only four significant decimal digit accuracy could be guaranteed.

Restriction 9. The user of the `libm` SHALL NOT assume that the value returned by any `double` or `long double` version of a `libm` function has an accuracy of more than six significant decimal digits.

Restriction 10. The user of `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the

`double tgamma(double x)`

function for negative values of `x`.

Note that the gamma function is not defined for negative integers.

Restriction 11. The user of `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the

`double ldexp(double x, int exp)`

function for values of `exp` outside the range [-100, 100].

Restriction 12. The user of `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the

`long double ldexpl(long double x, int exp)`

function for values of `exp` outside the range [-100, 100].

Restriction 13. The user of `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the

`double scalbn(double x, int exp)`

function for values of `exp` outside the range [-100, 100].

Restriction 14. The user of `libm` SHALL NOT make any assumptions about the accuracy of the results returned from the

`long double scalbnl(long double x, int exp)`

function for values of `exp` outside the range [-100, 100].

Restriction 20. The user of `libm` SHALL assume the accuracy of the results returned from the

`float fmodf(float x, float y)`

function is limited to three significant digits.

Restriction 22. The user of `libm` SHALL NOT expect the correct result from the function `casinhl()` when it is executed with the argument `NaN + i0.0`.

Given this parameter, `casinhl()` should return `NaN + i0.0`. In fact it returns `NaN + iNaN`.

3.5 Floating Point Emulation

Note that the *QNX OS for Safety* may be configured to force floating point emulation using `fpemu.so`. This library is not in scope and floating point emulation must not be forced on.

Restriction 17. The `-fe` option SHALL not be passed to `procnto` during startup.

3.6 Complex Numbers

Restriction 19. Complex functions from `complex.h` SHALL be used only with the `libm-sve.so` binary, and only on the ARMv8.2 architecture

CHAPTER 4

Recommendations

Contents

4.1 Introduction

This chapter lists recommended practices for using the `libm`.

It does not cover standard techniques associated with using floating point arithmetic safely in a software application as it is assumed that the reader is familiar with these; only issues specific to the use of the `libm` are covered here.

4.2 Host Environment Recommendations

Recommendation 1. Before a system using the `libm` is built, the user SHOULD check the integrity of the `libm`.

The QNX Software Center can be used to verify the correct installation of the `libm`. To confirm the integrity of installed software, select *Manage Installation* from the *Welcome* screen of the QNX Software Center to be taken to the *Advanced* tab. First, select the baseline installation that includes the `libm` from the drop-down list in the top right corner. Then, press the *Verify Installation* button. If the installation has become corrupted, the QNX Software Center will report the problem.

As an alternative, the checksum of each file can be verified against the revision list published by the certifying authority. This may be done following installation of the `libm`, prior to building a system that uses the `libm`, or at run time while a system that uses the `libm` is operating. The revision list may be found by searching the certifying authority's web site at https://fs-products.tuvasi.com/certificates?filter_prod=1&filter_apps=1&keywords=QNX&productcategory_id=1&x=0&y=0 and locating the entry for the current version of the `libm`. The checksum is the CRC generated by the `cksum` or equivalent utility in accordance with ISO/IEC 8802-3:1996.

4.3 Target Device Recommendations

Recommendation 2. An application accessing the `libm` SHOULD confirm at startup that the correct version of the `libm` is in use.

Refer to the *QNX OS for Safety 2.2 Safety Manual* for instructions on how to verify the version of certified binaries at runtime.

Recommendation 3. Before calling a function in the `libm`, an application SHOULD call `feclearexcept(FE_ALL_EXCEPT)`.

See the notes on restriction 3.4.1 on page 13. This is illustrated in section 5.1 on page 20.

Recommendation 4. After calling a function in the `libm`, an application SHOULD call `fetestexcept()`.

This is illustrated in section 5.1 on page 20.

4.4 Compiler options

The compiler may replace calls to `libm` functions with precomputed values. For example, `gcc` version 5.4 will not produce code to call the `sqrt()` function from the `libm` when compiling the statement

```
double x = sqrt(2.0);
```

Instead, the compiler will precompute the constant value $1.4142...$. In this case, any exception that may have been raised by a `libm` function will not be detected by a call to `fetestexcept()`.

The `-fno-builtin` compiler option forces the compiler to insert the `libm` functions in the generated code. However, the option may have unintended consequences on other parts of the code. Therefore, the `libm` functions should be isolated in seperate compilation units that are compiled with the `-fno-builtin` option to ensure that uncertified host libraries are not used to perform computations.

Recommendation 5. The user of the `libm` SHOULD collect libm functions into separate compilation units.

Recommendation 7. The user of `libm` SHOULD use the `-fno-builtin` compiler option when compiling code that invokes a function from the `libm`

CHAPTER 5

Points to Note

5.1 Error Conditions

As described in requirement 3.4.1 on page 13, the `libm` indicates an error by raising an FP exception, rather than by setting `errno`. ISO/IEC 9899 permits either method.

The normal outline of a call to a `libm` function would be:

```
feclearexcept(FE_ALL_EXCEPT);   /* clear all exceptions                */

x = asin(y);                    /* make the call to the libm function */

if (fetestexcept(FE_INVALID | FE_DIVBYZERO | FE_OVERFLOW |
                         FE_UNDERFLOW) != 0)
    {
    /* take error action */
    }
```

In this example, `fetestexcept()` is used to check for the most important exceptions. It can also be used to check for all exceptions.

Note that the `FE_INEXACT` exception may be raised if a rounded result is not exact, for example, when calculating a value which cannot be exactly represented such as $\sqrt{0.09}$ or $10.0^{-1.0}$. Note that 0.1, 0.9 and 0.3 are not exactly representable as binary values.

5.1.1 Quiet and Signalling NaNs

According to the C11 standard, a NaN (“not a number”) may be a quiet NaN or a signalling NaN. Only quiet NaNs have been verified for the functions in `libm`. Signalling NaNs are not returned from libm functions.

5.1.2 Domains

QSSL has verified the functions over the following domains:

1. Domains that are mathematically sensible and practically useful.

   For functions with finite domains, this covers the whole domain. For example, $\cos^{-1}(x)$ is covered in the domain $[-1.0, 1.0]$.

   For functions where the domain is doubly-infinite (e.g., $\sin(x)$) or singly-infinite (e.g., $\cosh^{-1}(x)$), a practically reasonable domain has been verified. For example $\sin(x)$ is verified over the domain $[-8\pi, +8\pi]$.

   These domains are listed in appendix A.

2. Invalid domains.

   Where a function does not have a doubly-infinite domain, a representative sample of invalid values is verified. For example, $\cos^{-1}(1.00000001)$.

3. Poles and other exceptional domain values.

   Where a function has poles or undefined values, a representative sample of these is verified. For example, $\Gamma(-4.0)$ and $\tan(\frac{\pi}{2})$.

4. Special domain values.

   All functions are verified for values that are special. This includes `+INFINITY`, `-INFINITY`, `NaN`, and `SUBNORMAL`.

   The subnormal numbers used are:

   - 7.25574×10^{-39} for `float`, `double` and `long double` versions of the function.
   - 1.37343×10^{-308} for `double` and `long double` versions of the function.
   - $3.3621031431120935053 \times 10^{-4932}$ for `long double` versions of the function.

Any customer wishing to use the mathematical functions outside these domains should contact QSSL.

5.1.3 Single Precision Floating Point Operation in Safety-Critical Products

Single precision floating point arithmetic in accordance with IEEE 754 has well known limitations. The mathematics library accuracy is limited by the floating point hardware.

For instance, single precision floating point hardware will produce the result of $16777216 + 1$ as 16777216.

APPENDIX A

Domains Verified

This appendix lists the standard domains covered for each function as described under point 1 in section 5.1.2. Note that, as described in that section, these do not represent all the input values verified: invalid and special domain values are also verified.

The symbol “j” is used in this chapter to represent the imaginary operator, rather than the more normal “i”.

double acos(double a)

Parameter 1 Domain 1: [-1, 0.9999] Step: 1e-06

float acosf(float a)

Parameter 1 Domain 1: [-1, 0.9999] Step: Minimum float representable

double acosh(double a)

Parameter 1 Domain 1: [1, 25] Step: 1e-06

float acoshf(float a)

Parameter 1 Domain 1: [1, 25] Step: 1e-06

long double acoshl(long double a)

Parameter 1 Domain 1: [1, 25] Step: 1e-06

long double acosl(long double a)

Parameter 1 Domain 1: [-1, 0.9999] Step: 1e-06

double asin(double a)

Parameter 1 Domain 1: [-1, 0.999999] Step: 1e-07

float asinf(float a)

Parameter 1 Domain 1: [-1, 0.999999] Step: 1e-07

double asinh(double a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

float asinhf(float a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

long double asinhl(long double a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

long double asinl(long double a)

Parameter 1 Domain 1: [-1, 0.999999] Step: 1e-07

double atan(double a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

double atan2(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [-1, 1] Step: 0.001

Parameter 2 Domain 1: [1, 2.5] Step: 0.001

Parameter 2 Domain 2: [0.04, 1] Step: 0.0001

float atan2f(float a,float b)

Parameter 1 Domain 1: [-1, 6] Step: 0.001

Parameter 1 Domain 2: [-1, 1] Step: 0.001

Parameter 2 Domain 1: [2, 5.5] Step: 0.0001

Parameter 2 Domain 2: [0.14, 1] Step: 0.0001

long double atan2l(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [-1, 1] Step: 0.001

Parameter 2 Domain 1: [1, 2.5] Step: 0.001

Parameter 2 Domain 2: [0.04, 1] Step: 0.0001

float atanf(float a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

double atanh(double a)

Parameter 1 Domain 1: (-1, 0.9999) Step: 1e-06

float atanhf(float a)

Parameter 1 Domain 1: (-1, -0.97) Step: Minimum float representable

Parameter 1 Domain 2: (-0.98, -0.79) Step: 1e-05

Parameter 1 Domain 3: (-0.8, 0.8) Step: 0.0033

Parameter 1 Domain 4: (0.79, 0.96) Step: 1e-05

Parameter 1 Domain 5: (0.97, 0.9999) Step: Minimum float representable

long double atanhl(long double a)

Parameter 1 Domain 1: (-1, 0.9999) Step: 1e-06

long double atanl(long double a)

Parameter 1 Domain 1: [-25, 25] Step: 1e-06

double cabs(double complex a)

Parameter 1 Domain 1: [-100-100j, -0.1-0.1j] Step: 0.001+0.001j

Parameter 1 Domain 2: [0.1+0.1j, 100+100j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.25-0.25j, -0.001-0.001j] Step: 1e-05+1e-05j

Parameter 1 Domain 4: [0.001+0.001j, 0.25+0.25j] Step: 1e-05+1e-05j

long double cabsl(long double complex a)

Parameter 1 Domain 1: [-100-100j, -0.1-0.1j] Step: 0.001+0.001j

Parameter 1 Domain 2: [0.1+0.1j, 100+100j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.25-0.25j, -0.001-0.001j] Step: 1e-05+1e-05j

Parameter 1 Domain 4: [0.001+0.001j, 0.25+0.25j] Step: 1e-05+1e-05j

double complex cacos(double complex a)

Parameter 1 Domain 1: [-10-10j, -1.05-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, -1.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.95-10j, 0.95+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [1.05+0.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1.05-10j, 10-0.05j] Step: 0.001+0.001j

double complex cacosh(double complex a)

Parameter 1 Domain 1: [-10-10j, 10-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, 10+10j] Step: 0.001+0.001j

long double complex cacoshl(long double complex a)

Parameter 1 Domain 1: [-10-10j, 10-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, 10+10j] Step: 0.001+0.001j

long double complex cacosl(long double complex a)

Parameter 1 Domain 1: [-10-10j, -1.05-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, -1.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.95-10j, 0.95+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [1.05+0.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1.05-10j, 10-0.05j] Step: 0.001+0.001j

double carg(double complex a)

Parameter 1 Domain 1: [-20-10j, 20-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-20+0.05j, 20+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [0.1-10j, 10+10j] Step: 0.001+0.001j

long double cargl(long double complex a)

Parameter 1 Domain 1: [-20-10j, 20-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-20+0.05j, 20+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [0.1-10j, 10+10j] Step: 0.001+0.001j

double complex casin(double complex a)

Parameter 1 Domain 1: [-10-10j, -1.05-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, -1.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.95-10j, 0.95+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [1.05+0.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1.05-10j, 10-0.05j] Step: 0.001+0.001j

double complex casinh(double complex a)

Parameter 1 Domain 1: [-10-10j, -0.05-1.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10-0.95j, 10+0.95j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-10-1.05j, -0.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [0.05+1.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [0.05-10j, 10-1.05j] Step: 0.001+0.001j

long double complex casinhl(long double complex a)

Parameter 1 Domain 1: [-10-10j, -0.05-1.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10-0.95j, 10+0.95j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-10-1.05j, -0.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [0.05+1.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [0.05-10j, 10-1.05j] Step: 0.001+0.001j

long double complex casinl(long double complex a)

Parameter 1 Domain 1: [-10-10j, -1.05-0.05j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10+0.05j, -1.05+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [-0.95-10j, 0.95+10j] Step: 0.001+0.001j

Parameter 1 Domain 4: [1.05+0.05j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1.05-10j, 10-0.05j] Step: 0.001+0.001j

double complex catan(double complex a)

Parameter 1 Domain 1: [-0.5-0.5j, 0.5+0.5j] Step: 0.0001+0.0001j

double complex catanh(double complex a)

Parameter 1 Domain 1: [-0.5-0.5j, 0.5+0.5j] Step: 0.0001+0.0001j

long double complex catanhl(long double complex a)

Parameter 1 Domain 1: [-0.5-0.5j, 0.5+0.5j] Step: 0.0001+0.0001j

long double complex catanl(long double complex a)

Parameter 1 Domain 1: [-0.5-0.5j, 0.5+0.5j] Step: 0.0001+0.0001j

double cbrt(double a)

Parameter 1 Domain 1: [-1000, -0.002] Step: 1e-05

Parameter 1 Domain 2: [-0.001, -0.0001] Step: 1e-06

Parameter 1 Domain 3: [-1000000, -999] Step: 0.0005

Parameter 1 Domain 4: [999, 1000000] Step: 0.0005

Parameter 1 Domain 5: [-1e+99, -1e+97] Step: 2e+95

Parameter 1 Domain 6: [-1e+97, 1e+97] Step: 2e+95

Parameter 1 Domain 7: [1e+97, 1e+99] Step: 2e+95

Parameter 1 Domain 8: [0.001, 1000] Step: 0.0001

float cbrtf(float a)

Parameter 1 Domain 1: [-1000, -0.9] Step: 0.0001

Parameter 1 Domain 2: [-1, -0.0009] Step: 1e-05

Parameter 1 Domain 3: [-0.001, -0.0001] Step: 1e-06

Parameter 1 Domain 4: [-1000000, -1] Step: 0.1

Parameter 1 Domain 5: [1, 1000000] Step: 0.1

Parameter 1 Domain 6: [0.001, 1000] Step: 0.0001

long double cbrtl(long double a)

Parameter 1 Domain 1: [-1000, -0.002] Step: 1e-05

Parameter 1 Domain 2: [-0.001, -0.0001] Step: 1e-06

Parameter 1 Domain 3: [-1000000, -999] Step: 0.0005

Parameter 1 Domain 4: [999, 1000000] Step: 0.0005

Parameter 1 Domain 5: [-1e+99, -1e+97] Step: 2e+95

Parameter 1 Domain 6: [-1e+97, 1e+97] Step: 2e+95

Parameter 1 Domain 7: [1e+97, 1e+99] Step: 2e+95

Parameter 1 Domain 8: [0.001, 1000] Step: 0.0001

double complex ccos(double complex a)

Parameter 1 Domain 1: [-7.8549816-12.567371j, -1.5697963-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-7.8549816-6.2841853j, -1.5697963+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-7.8549816-0.001j, -1.5697963+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-7.8549816+6.2821853j, -1.5697963+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.5717963-12.567371j, 4.713389-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-1.5717963-6.2841853j, 4.713389+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1.5717963-0.001j, 4.713389+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 8: [-1.5717963+6.2821853j, 4.713389+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 9: [4.711389-12.567371j, 10.996574-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 10: [4.711389-6.2841853j, 10.996574+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 11: [4.711389-0.001j, 10.996574+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 12: [4.711389+6.2821853j, 10.996574+12.567371j] Step: 0.0001+0.0001j

double complex ccosh(double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex ccoshl(long double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex ccosl(long double complex a)

Parameter 1 Domain 1: [-7.8549816-12.567371j, -1.5697963-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-7.8549816-6.2841853j, -1.5697963+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-7.8549816-0.001j, -1.5697963+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-7.8549816+6.2821853j, -1.5697963+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.5717963-12.567371j, 4.713389-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-1.5717963-6.2841853j, 4.713389+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1.5717963-0.001j, 4.713389+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 8: [-1.5717963+6.2821853j, 4.713389+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 9: [4.711389-12.567371j, 10.996574-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 10: [4.711389-6.2841853j, 10.996574+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 11: [4.711389-0.001j, 10.996574+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 12: [4.711389+6.2821853j, 10.996574+12.567371j] Step: 0.0001+0.0001j

double ceil(double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 4: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 5: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 6: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 7: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 8: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 9: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 10: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 11: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 12: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 13: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 14: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 15: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 16: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 17: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 18: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 19: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 20: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 21: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 22: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 23: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 24: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 25: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 26: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 27: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 28: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 29: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 30: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 31: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 32: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 33: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 34: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 35: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 36: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 37: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 38: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 39: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 40: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 41: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 42: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 43: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 44: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 45: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 46: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 47: [234, 235) Step: 1e-05

float ceilf(float a)

Parameter 1 Domain 1: (-0.999, 0) Step: Minimum float representable

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 4: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 5: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 6: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 7: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 8: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 9: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 10: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 11: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 12: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 13: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 14: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 15: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 16: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 17: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 18: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 19: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 20: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 21: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 22: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 23: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 24: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 25: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 26: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 27: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 28: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 29: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 30: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 31: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 32: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 33: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 34: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 35: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 36: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 37: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 38: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 39: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 40: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 41: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 42: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 43: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 44: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 45: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 46: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 47: (-23.99999, -23) Step: Minimum float representable

Parameter 1 Domain 48: [234, 235) Step: Minimum float representable

long double ceill(long double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 4: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 5: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 6: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 7: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 8: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 9: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 10: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 11: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 12: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 13: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 14: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 15: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 16: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 17: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 18: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 19: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 20: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 21: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 22: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 23: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 24: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 25: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 26: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 27: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 28: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 29: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 30: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 31: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 32: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 33: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 34: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 35: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 36: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 37: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 38: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 39: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 40: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 41: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 42: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 43: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 44: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 45: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 46: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 47: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 48: [234, 235) Step: 1e-05

double complex cexp(double complex a)

Parameter 1 Domain 1: [-10-10j, 10+10j] Step: 0.0001+0.001j

long double complex cexpl(long double complex a)

Parameter 1 Domain 1: [-10-10j, 10+10j] Step: 0.0001+0.001j

double cimag(double complex a)

Parameter 1 Domain 1: [-10-10j, -1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-10+1j, 1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [1-10j, 10-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1+1j, 10+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.1-10j, 1.1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-10-1.1j, 10+1.1j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1e-15-1e-15j, 1e+15+1e+15j] Step: 1e+11+1e+11j

long double cimagl(long double complex a)

Parameter 1 Domain 1: [-10-10j, -1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-10+1j, 1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [1-10j, 10-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1+1j, 10+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.1-10j, 1.1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-10-1.1j, 10+1.1j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1e-15-1e-15j, 1e+15+1e+15j] Step: 1e+11+1e+11j

double complex clog(double complex a)

Parameter 1 Domain 1: [-1+0.01j, 1+1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-1-0.01j, 1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [0.01-0.5j, 1+0.5j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1-100j, 1000+100j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1000-100j, 100000+100j] Step: 0.1+0.1j

long double complex clogl(long double complex a)

Parameter 1 Domain 1: [-1+0.01j, 1+1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-1-0.01j, 1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [0.01-0.5j, 1+0.5j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1-100j, 1000+100j] Step: 0.001+0.001j

Parameter 1 Domain 5: [1000-100j, 100000+100j] Step: 0.1+0.1j

double complex conj(double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex conjl(long double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

double copysign(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.01

Parameter 1 Domain 2: [100, 110] Step: 0.01

Parameter 1 Domain 3: [-1000, 1000] Step: 0.1

Parameter 2 Domain 1: [10, 19] Step: 0.01

Parameter 2 Domain 2: [-10, -0.0001] Step: 0.01

Parameter 2 Domain 3: [-2000, -1000.1] Step: 0.1

float copysignf(float a,float b)

Parameter 1 Domain 1: [-10, 10] Step: 0.01

Parameter 1 Domain 2: [100, 110] Step: 0.01

Parameter 1 Domain 3: [-1000, 1000] Step: 0.1

Parameter 2 Domain 1: [10, 19] Step: 0.01

Parameter 2 Domain 2: [-10, -0.0001] Step: 0.01

Parameter 2 Domain 3: [-2000, -1000.1] Step: 0.1

long double copysignl(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.01

Parameter 1 Domain 2: [100, 110] Step: 0.01

Parameter 1 Domain 3: [-1000, 1000] Step: 0.1

Parameter 2 Domain 1: [10, 19] Step: 0.01

Parameter 2 Domain 2: [-10, -0.0001] Step: 0.01

Parameter 2 Domain 3: [-2000, -1000.1] Step: 0.1

double cos(double a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-06

float cosf(float a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-06

double cosh(double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

float coshf(float a)

Parameter 1 Domain 1: [-20, 16] Step: Minimum float representable

long double coshl(long double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

long double cosl(long double a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-05

double complex cproj(double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex cprojl(long double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

double creal(double complex a)

Parameter 1 Domain 1: [-10-10j, -1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-10+1j, 1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [1-10j, 10-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1+1j, 10+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.1-10j, 1.1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-10-1.1j, 10+1.1j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1e-15-1e-15j, 1e+15+1e+15j] Step: 1e+11+1e+11j

long double creall(long double complex a)

Parameter 1 Domain 1: [-10-10j, -1-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-10+1j, 1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [1-10j, 10-1j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1+1j, 10+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.1-10j, 1.1+10j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-10-1.1j, 10+1.1j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1e-15-1e-15j, 1e+15+1e+15j] Step: 1e+11+1e+11j

double complex csin(double complex a)

Parameter 1 Domain 1: [-7.8549816-12.567371j, -1.5697963-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-7.8549816-6.2841853j, -1.5697963+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-7.8549816-0.001j, -1.5697963+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-7.8549816+6.2821853j, -1.5697963+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.5717963-12.567371j, 4.713389-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-1.5717963-6.2841853j, 4.713389+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1.5717963-0.001j, 4.713389+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 8: [-1.5717963+6.2821853j, 4.713389+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 9: [4.711389-12.567371j, 10.996574-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 10: [4.711389-6.2841853j, 10.996574+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 11: [4.711389-0.001j, 10.996574+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 12: [4.711389+6.2821853j, 10.996574+12.567371j] Step: 0.0001+0.0001j

double complex csinh(double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex csinhl(long double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex csinl(long double complex a)

Parameter 1 Domain 1: [-7.8549816-12.567371j, -1.5697963-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 2: [-7.8549816-6.2841853j, -1.5697963+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-7.8549816-0.001j, -1.5697963+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-7.8549816+6.2821853j, -1.5697963+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-1.5717963-12.567371j, 4.713389-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [-1.5717963-6.2841853j, 4.713389+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 7: [-1.5717963-0.001j, 4.713389+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 8: [-1.5717963+6.2821853j, 4.713389+12.567371j] Step: 0.0001+0.0001j

Parameter 1 Domain 9: [4.711389-12.567371j, 10.996574-6.2821853j] Step: 0.0001+0.0001j

Parameter 1 Domain 10: [4.711389-6.2841853j, 10.996574+0.001j] Step: 0.0001+0.0001j

Parameter 1 Domain 11: [4.711389-0.001j, 10.996574+6.2841853j] Step: 0.0001+0.0001j

Parameter 1 Domain 12: [4.711389+6.2821853j, 10.996574+12.567371j] Step: 0.0001+0.0001j

double complex csqrt(double complex a)

Parameter 1 Domain 1: [-10+0.1j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10-10j, 0-4.99j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-0-10j, 10-4.99j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-10-5.01j, 0-0.01j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-0-5.01j, 10-0.01j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [0.001-1j, 0.5+0.01j] Step: 1e-05+1e-05j

Parameter 1 Domain 7: [0.001-0.01j, 0.5+1j] Step: 1e-05+1e-05j

Parameter 1 Domain 8: [0.499-1j, 1.1+0.01j] Step: 1e-05+1e-05j

Parameter 1 Domain 9: [0.499-0.01j, 1.1+1j] Step: 1e-05+1e-05j

Parameter 1 Domain 10: [0.05-100j, 1.1+100j] Step: 0.001+0.0001j

Parameter 1 Domain 11: [0.1-1000j, 250+1j] Step: 0.01+0.0025j

Parameter 1 Domain 12: [0.1-1j, 250+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 13: [249-1000j, 500+1j] Step: 0.01+0.0025j

Parameter 1 Domain 14: [249-1j, 500+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 15: [499-1000j, 750+1j] Step: 0.01+0.0025j

Parameter 1 Domain 16: [499-1j, 750+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 17: [749-1000j, 1000+1j] Step: 0.01+0.0025j

Parameter 1 Domain 18: [749-1j, 1000+1000j] Step: 0.01+0.0025j

long double complex csqrtl(long double complex a)

Parameter 1 Domain 1: [-10+0.1j, 10+10j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-10-10j, 0-4.99j] Step: 0.0001+0.0001j

Parameter 1 Domain 3: [-0-10j, 10-4.99j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [-10-5.01j, 0-0.01j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-0-5.01j, 10-0.01j] Step: 0.0001+0.0001j

Parameter 1 Domain 6: [0.001-1j, 0.5+0.01j] Step: 1e-05+1e-05j

Parameter 1 Domain 7: [0.001-0.01j, 0.5+1j] Step: 1e-05+1e-05j

Parameter 1 Domain 8: [0.499-1j, 1.1+0.01j] Step: 1e-05+1e-05j

Parameter 1 Domain 9: [0.499-0.01j, 1.1+1j] Step: 1e-05+1e-05j

Parameter 1 Domain 10: [0.05-100j, 1.1+100j] Step: 0.001+0.0001j

Parameter 1 Domain 11: [0.1-1000j, 250+1j] Step: 0.01+0.0025j

Parameter 1 Domain 12: [0.1-1j, 250+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 13: [249-1000j, 500+1j] Step: 0.01+0.0025j

Parameter 1 Domain 14: [249-1j, 500+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 15: [499-1000j, 750+1j] Step: 0.01+0.0025j

Parameter 1 Domain 16: [499-1j, 750+1000j] Step: 0.01+0.0025j

Parameter 1 Domain 17: [749-1000j, 1000+1j] Step: 0.01+0.0025j

Parameter 1 Domain 18: [749-1j, 1000+1000j] Step: 0.01+0.0025j

double complex ctan(double complex a)

Parameter 1 Domain 1: [-25-10j, 25-0.5j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-25+0.5j, 25+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [1.59-30j, 2.41+30j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1.59-1j, 4.5+1j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-7.7-1j, -4.75+1j] Step: 0.0001+0.0001j

double complex ctanh(double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, -0.13274123+25.132741j] Step: 0.001+0.001j

Parameter 1 Domain 2: [0.13274123-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex ctanhl(long double complex a)

Parameter 1 Domain 1: [-25.132741-25.132741j, -0.13274123+25.132741j] Step: 0.001+0.001j

Parameter 1 Domain 2: [0.13274123-25.132741j, 25.132741+25.132741j] Step: 0.001+0.001j

long double complex ctanl(long double complex a)

Parameter 1 Domain 1: [-25-10j, 25-0.5j] Step: 0.001+0.001j

Parameter 1 Domain 2: [-25+0.5j, 25+10j] Step: 0.001+0.001j

Parameter 1 Domain 3: [1.59-30j, 2.41+30j] Step: 0.0001+0.0001j

Parameter 1 Domain 4: [1.59-1j, 4.5+1j] Step: 0.0001+0.0001j

Parameter 1 Domain 5: [-7.7-1j, -4.75+1j] Step: 0.0001+0.0001j

double erf(double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

double erfc(double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

float erfcf(float a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

long double erfcl(long double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

float erff(float a)

Parameter 1 Domain 1: [-20, 20] Step: Minimum float representable

long double erfl(long double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

double exp(double a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-05

double exp2(double a)

Parameter 1 Domain 1: [-100, 100] Step: 1e-06

float exp2f(float a)

Parameter 1 Domain 1: [-100, 100] Step: Minimum float representable

long double exp2l(long double a)

Parameter 1 Domain 1: [-100, 100] Step: 1e-06

float expf(float a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-05

long double expl(long double a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-06

double expm1(double a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-05

float expm1f(float a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-05

long double expm1l(long double a)

Parameter 1 Domain 1: [-10, 10] Step: 1e-05

double fabs(double a)

Parameter 1 Domain 1: [-10000, 0] Step: 0.001

Parameter 1 Domain 2: [0, 10000] Step: 0.001

float fabsf(float a)

Parameter 1 Domain 1: [-10000, 0] Step: 0.0009

Parameter 1 Domain 2: [0, 10000] Step: 0.0009

long double fabsl(long double a)

Parameter 1 Domain 1: [-10000, 0] Step: 0.001

Parameter 1 Domain 2: [0, 10000] Step: 0.001

double fdim(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

float fdimf(float a,float b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

long double fdiml(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

double floor(double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: [-23000.1, 23000.1] Step: 1

Parameter 1 Domain 3: [-23000.2, 23000.2] Step: 1

Parameter 1 Domain 4: [-23000.3, 23000.3] Step: 1

Parameter 1 Domain 5: [-23000.4, 23000.4] Step: 1

Parameter 1 Domain 6: [-23000.5, 23000.5] Step: 1

Parameter 1 Domain 7: [-23000.6, 23000.6] Step: 1

Parameter 1 Domain 8: [-23000.7, 23000.7] Step: 1

Parameter 1 Domain 9: [-23000.8, 23000.8] Step: 1

Parameter 1 Domain 10: [-23000.9, 23000.9] Step: 1

Parameter 1 Domain 11: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 12: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 13: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 14: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 15: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 16: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 17: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 18: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 19: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 20: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 21: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 22: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 23: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 24: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 25: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 26: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 27: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 28: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 29: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 30: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 31: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 32: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 33: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 34: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 35: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 36: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 37: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 38: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 39: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 40: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 41: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 42: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 43: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 44: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 45: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 46: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 47: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 48: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 49: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 50: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 51: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 52: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 53: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 54: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 55: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 56: [234, 235) Step: 1e-05

float floorf(float a)

Parameter 1 Domain 1: (-0.999, 0) Step: Minimum float representable

Parameter 1 Domain 2: [-23000.1, 23000.1] Step: 1

Parameter 1 Domain 3: [-23000.2, 23000.2] Step: 1

Parameter 1 Domain 4: [-23000.3, 23000.3] Step: 1

Parameter 1 Domain 5: [-23000.4, 23000.4] Step: 1

Parameter 1 Domain 6: [-23000.5, 23000.5] Step: 1

Parameter 1 Domain 7: [-23000.6, 23000.6] Step: 1

Parameter 1 Domain 8: [-23000.7, 23000.7] Step: 1

Parameter 1 Domain 9: [-23000.8, 23000.8] Step: 1

Parameter 1 Domain 10: [-23000.9, 23000.9] Step: 1

Parameter 1 Domain 11: (-23.99999, -23) Step: Minimum float representable

Parameter 1 Domain 12: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 13: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 14: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 15: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 16: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 17: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 18: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 19: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 20: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 21: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 22: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 23: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 24: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 25: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 26: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 27: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 28: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 29: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 30: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 31: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 32: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 33: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 34: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 35: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 36: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 37: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 38: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 39: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 40: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 41: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 42: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 43: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 44: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 45: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 46: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 47: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 48: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 49: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 50: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 51: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 52: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 53: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 54: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 55: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 56: [234, 235) Step: Minimum float representable

long double floorl(long double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: (-22.99999, -22) Step: 1e-05

Parameter 1 Domain 4: (-21.99999, -21) Step: 1e-05

Parameter 1 Domain 5: (-20.99999, -20) Step: 1e-05

Parameter 1 Domain 6: (-19.99999, -19) Step: 1e-05

Parameter 1 Domain 7: (-18.99999, -18) Step: 1e-05

Parameter 1 Domain 8: (-17.99999, -17) Step: 1e-05

Parameter 1 Domain 9: (-16.99999, -16) Step: 1e-05

Parameter 1 Domain 10: (-15.99999, -15) Step: 1e-05

Parameter 1 Domain 11: (-14.99999, -14) Step: 1e-05

Parameter 1 Domain 12: (-13.99999, -13) Step: 1e-05

Parameter 1 Domain 13: (-12.99999, -12) Step: 1e-05

Parameter 1 Domain 14: (-11.99999, -11) Step: 1e-05

Parameter 1 Domain 15: (-10.99999, -10) Step: 1e-05

Parameter 1 Domain 16: (-9.99999, -9) Step: 1e-05

Parameter 1 Domain 17: (-8.99999, -8) Step: 1e-05

Parameter 1 Domain 18: (-7.99999, -7) Step: 1e-05

Parameter 1 Domain 19: (-6.99999, -6) Step: 1e-05

Parameter 1 Domain 20: (-5.99999, -5) Step: 1e-05

Parameter 1 Domain 21: (-4.99999, -4) Step: 1e-05

Parameter 1 Domain 22: (-3.99999, -3) Step: 1e-05

Parameter 1 Domain 23: (-2.99999, -2) Step: 1e-05

Parameter 1 Domain 24: (-1.99999, -1) Step: 1e-05

Parameter 1 Domain 25: (-0.99999, 0) Step: 1e-05

Parameter 1 Domain 26: (1e-06, 1) Step: 1e-05

Parameter 1 Domain 27: (1.000001, 2) Step: 1e-05

Parameter 1 Domain 28: (2.000001, 3) Step: 1e-05

Parameter 1 Domain 29: (3.000001, 4) Step: 1e-05

Parameter 1 Domain 30: (4.000001, 5) Step: 1e-05

Parameter 1 Domain 31: (5.000001, 6) Step: 1e-05

Parameter 1 Domain 32: (6.000001, 7) Step: 1e-05

Parameter 1 Domain 33: (7.000001, 8) Step: 1e-05

Parameter 1 Domain 34: (8.000001, 9) Step: 1e-05

Parameter 1 Domain 35: (9.000001, 10) Step: 1e-05

Parameter 1 Domain 36: (10.000001, 11) Step: 1e-05

Parameter 1 Domain 37: (11.000001, 12) Step: 1e-05

Parameter 1 Domain 38: (12.000001, 13) Step: 1e-05

Parameter 1 Domain 39: (13.000001, 14) Step: 1e-05

Parameter 1 Domain 40: (14.000001, 15) Step: 1e-05

Parameter 1 Domain 41: (15.000001, 16) Step: 1e-05

Parameter 1 Domain 42: (16.000001, 17) Step: 1e-05

Parameter 1 Domain 43: (17.000001, 18) Step: 1e-05

Parameter 1 Domain 44: (18.000001, 19) Step: 1e-05

Parameter 1 Domain 45: (19.000001, 20) Step: 1e-05

Parameter 1 Domain 46: (20.000001, 21) Step: 1e-05

Parameter 1 Domain 47: [234, 235) Step: 1e-05

double fma(double a,double b,double c)

Parameter 1 Domain 1: [-5, 5] Step: 1e-05

Parameter 2 Domain 1: [-5, 5] Step: 1e-05

Parameter 3 Domain 1: [-5, 5] Step: 1e-05

double fmax(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [1000, 2000] Step: 0.001

Parameter 2 Domain 1: [11000, 19000] Step: 0.01

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

float fmaxf(float a,float b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

long double fmaxl(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [1000, 2000] Step: 0.001

Parameter 2 Domain 1: [11000, 19000] Step: 0.01

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

double fmin(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

float fminf(float a,float b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.001

long double fminl(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

double fmod(double a,double b)

Parameter 1 Domain 1: [12639, 12645.05] Step: 0.003

Parameter 1 Domain 2: [-12645, -12639] Step: 0.003

Parameter 1 Domain 3: [-25064.05, -25040.35] Step: 0.0003

Parameter 1 Domain 4: [-25366.45, -25011.15] Step: 0.0003

Parameter 2 Domain 1: [3161, 4212] Step: 0.003

Parameter 2 Domain 2: [3161, 4212] Step: 0.003

Parameter 2 Domain 3: [-204.78, -203.78] Step: 0.0003

Parameter 2 Domain 4: [925.3, 926.25] Step: 0.0003

float fmodf(float a,float b)

Parameter 1 Domain 1: [12639, 12645.05] Step: 0.003

Parameter 1 Domain 2: [-12645, -12639] Step: 0.003

Parameter 1 Domain 3: [-25064.05, -25040.35] Step: 0.003

Parameter 1 Domain 4: [-25366.45, -25011.15] Step: 0.003

Parameter 2 Domain 1: [3161, 4212] Step: 0.003

Parameter 2 Domain 2: [3161, 4212] Step: 0.003

Parameter 2 Domain 3: [-204.78, -203.78] Step: 0.003

Parameter 2 Domain 4: [925.3, 926.25] Step: 0.003

long double fmodl(long double a,long double b)

Parameter 1 Domain 1: [12639, 12645.05] Step: 0.003

Parameter 1 Domain 2: [-12645, -12639] Step: 0.003

Parameter 1 Domain 3: [-25064.05, -25040.35] Step: 0.0003

Parameter 1 Domain 4: [-25366.45, -25011.15] Step: 0.0003

Parameter 2 Domain 1: [3161, 4212] Step: 0.003

Parameter 2 Domain 2: [3161, 4212] Step: 0.003

Parameter 2 Domain 3: [-204.78, -203.78] Step: 0.0003

Parameter 2 Domain 4: [925.3, 926.25] Step: 0.0003

double hypot(double a,double b)

Parameter 1 Domain 1: [0.1, 10] Step: 0.001

Parameter 1 Domain 2: [0.01, 10] Step: 0.001

Parameter 2 Domain 1: [-11, -0.3] Step: 0.02

Parameter 2 Domain 2: [20, 30] Step: 0.01

float hypotf(float a,float b)

Parameter 1 Domain 1: [0.1, 10] Step: 0.001

Parameter 1 Domain 2: [0.01, 10] Step: 0.001

Parameter 2 Domain 1: [-11, -0.8] Step: 0.02

Parameter 2 Domain 2: [20, 30] Step: 0.01

long double hypotl(long double a,long double b)

Parameter 1 Domain 1: [0.1, 10] Step: 0.001

Parameter 1 Domain 2: [0.01, 10] Step: 0.001

Parameter 2 Domain 1: [-11, -0.3] Step: 0.01

Parameter 2 Domain 2: [20, 30] Step: 0.0001

int ilogb(double a)

Parameter 1 Domain 1: (-15.999999, -8) Step: 0.0001

Parameter 1 Domain 2: (-9, -8] Step: 0.0001

Parameter 1 Domain 3: [8, 9] Step: 0.0001

Parameter 1 Domain 4: (0.51, 0.9999) Step: 0.0001

Parameter 1 Domain 5: (0.251, 0.49999) Step: 0.0001

int ilogbf(float a)

Parameter 1 Domain 1: (-15.99999, -8) Step: 0.0001

Parameter 1 Domain 2: (-9, -8] Step: 0.0001

Parameter 1 Domain 3: [8, 9] Step: 0.0001

Parameter 1 Domain 4: (0.51, 0.9999) Step: 0.0001

Parameter 1 Domain 5: (0.251, 0.49999) Step: 0.0001

int ilogbl(long double a)

Parameter 1 Domain 1: (-15.999999, -8) Step: 0.0001

Parameter 1 Domain 2: (-9, -8] Step: 0.0001

Parameter 1 Domain 3: [8, 9] Step: 0.0001

Parameter 1 Domain 4: (0.51, 0.9999) Step: 0.0001

Parameter 1 Domain 5: (0.251, 0.49999) Step: 0.0001

int isfinite(double a)

Parameter 1 Domain 1: [-10000, 10000] Step: 0.001

Parameter 1 Domain 2: [-1e+09, 1e+09] Step: 100.1

int isgreater(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

int isgreaterequal(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

int isinf(long double a)

Parameter 1 Domain 1: [-100000, 100000] Step: 0.1

Parameter 1 Domain 2: [-1, 1] Step: 1e-06

int isless(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

int islessequal(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.001

Parameter 1 Domain 2: [100, 110] Step: 0.001

Parameter 2 Domain 1: [10, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

int islessgreater(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.01

Parameter 1 Domain 2: [100, 110] Step: 0.01

Parameter 1 Domain 3: [-1000, 1000] Step: 0.01

Parameter 2 Domain 1: [10.00001, 19] Step: 0.01

Parameter 2 Domain 2: [-10, 10.999] Step: 0.01

Parameter 2 Domain 3: [-2000, -1000.1] Step: 0.1

int isnan(double a)

Parameter 1 Domain 1: [-9.424778, 9.424778] Step: 1e-06

Parameter 1 Domain 2: [-10, 10] Step: 0.001

Parameter 1 Domain 3: [0, 0.1] Step: 1e-05

Parameter 1 Domain 4: [-1, 0] Step: 1e-05

int isnormal(double a)

Parameter 1 Domain 1: [1, 1000] Step: 1

Parameter 1 Domain 2: [-10, -1e-06] Step: 1e-05

Parameter 1 Domain 3: [1e-06, 1000.1] Step: 1e-05

int isunordered(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.01

Parameter 1 Domain 2: [100, 110] Step: 0.01

Parameter 1 Domain 3: [-1000, 1000] Step: 0.1

Parameter 2 Domain 1: [10.00001, 19] Step: 0.01

Parameter 2 Domain 2: [-10, 10.999] Step: 0.01

Parameter 2 Domain 3: [-2000, 1000.1] Step: 0.1

double ldexp(double a,int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 1e-06

Parameter 2 Domain 1: [0, 150] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

float ldexpf(float a,int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 1e-05

Parameter 2 Domain 1: [0, 150] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

long double ldexpl(long double a,int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 1e-06

Parameter 2 Domain 1: [0, 130] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

double lgamma(double a)

Parameter 1 Domain 1: (-10, -9.0001) Step: 1e-06

Parameter 1 Domain 2: (-8.9999, -8.001) Step: 1e-05

Parameter 1 Domain 3: (-7.9999, -7.001) Step: 1e-05

Parameter 1 Domain 4: (-6.9999, -6.001) Step: 1e-07

Parameter 1 Domain 5: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 6: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 7: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 8: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 9: [12, 20] Step: 0.001

float lgammaf(float a)

Parameter 1 Domain 1: (-10, -9.0001) Step: 1e-06

Parameter 1 Domain 2: (-8.9999, -8.001) Step: 1e-05

Parameter 1 Domain 3: (-7.9999, -7.001) Step: 1e-05

Parameter 1 Domain 4: (-6.9999, -6.01) Step: 1e-05

Parameter 1 Domain 5: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 6: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 7: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 8: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 9: [12, 20] Step: 0.001

long double lgammal(long double a)

Parameter 1 Domain 1: (-10, -9.0001) Step: 1e-06

Parameter 1 Domain 2: (-8.9999, -8.001) Step: 1e-05

Parameter 1 Domain 3: (-7.9999, -7.001) Step: 1e-05

Parameter 1 Domain 4: (-6.9999, -6.001) Step: 1e-07

Parameter 1 Domain 5: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 6: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 7: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 8: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 9: [12, 20] Step: 0.001

long long int llrint(double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 1e-05

long long int llrintf(float a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 0.0001

long long int llrintl(long double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 1e-05

long long int llround(double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 3: [234.5, 235.5) Step: 1e-05

long long int llroundf(float a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 0.0001

Parameter 1 Domain 2: (-23.5, -22.5) Step: 0.0001

Parameter 1 Domain 3: [234.5, 235.5) Step: 0.0001

long long int llroundl(long double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 3: [234.5, 235.5) Step: 1e-05

double log(double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 20] Step: 1e-06

double log10(double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 200] Step: 1e-06

float log10f(float a)

Parameter 1 Domain 1: (1, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 200] Step: 1e-05

long double log10l(long double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 200] Step: 1e-06

double log1p(double a)

Parameter 1 Domain 1: (-1, 10000] Step: 0.001

Parameter 1 Domain 2: (-1, 20] Step: 1e-06

Parameter 1 Domain 3: (-1, 1] Step: 1e-07

float log1pf(float a)

Parameter 1 Domain 1: (1, 10000] Step: 0.001

Parameter 1 Domain 2: (-1, -0.1] Step: 1e-06

Parameter 1 Domain 3: (0.4, 20] Step: 1e-06

Parameter 1 Domain 4: (-0.5, 0.5] Step: Minimum float representable

long double log1pl(long double a)

Parameter 1 Domain 1: (-1, 10000] Step: 0.001

Parameter 1 Domain 2: (-1, 20] Step: 1e-06

Parameter 1 Domain 3: (-1, 1] Step: 1e-07

double log2(double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 64] Step: 1e-06

float log2f(float a)

Parameter 1 Domain 1: (0, 10000] Step: 0.0005

Parameter 1 Domain 2: (0, 64] Step: 1e-05

long double log2l(long double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 64] Step: 1e-06

double logb(double a)

Parameter 1 Domain 1: (-31.9999, -16] Step: 1e-05

Parameter 1 Domain 2: (-15.9999, -8] Step: 1e-05

Parameter 1 Domain 3: [8, 15.9999] Step: 1e-05

Parameter 1 Domain 4: (0.51, 0.9999) Step: 1e-05

Parameter 1 Domain 5: (0.251, 0.49999) Step: 1e-05

float logbf(float a)

Parameter 1 Domain 1: (-31.9999, -16] Step: 1e-05

Parameter 1 Domain 2: (-15.9999, -8] Step: 1e-05

Parameter 1 Domain 3: [8, 15.9999] Step: 1e-05

Parameter 1 Domain 4: (0.51, 0.9999) Step: 1e-05

Parameter 1 Domain 5: (0.251, 0.49999) Step: 1e-05

long double logbl(long double a)

Parameter 1 Domain 1: (-31.9999, -16] Step: 1e-05

Parameter 1 Domain 2: (-15.9999, -8] Step: 1e-05

Parameter 1 Domain 3: [8, 15.9999] Step: 1e-05

Parameter 1 Domain 4: (0.51, 0.9999) Step: 1e-05

Parameter 1 Domain 5: (0.251, 0.49999) Step: 1e-05

float logf(float a)

Parameter 1 Domain 1: (1, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 20] Step: 1e-06

long double logl(long double a)

Parameter 1 Domain 1: (0, 10000] Step: 0.001

Parameter 1 Domain 2: (0, 20] Step: 1e-06

long int lrint(double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 1e-05

long int lrintf(float a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 0.0001

long int lrintl(long double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.9999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 1e-05

long int lround(double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 3: [234.5, 235.5) Step: 1e-05

long int lroundf(float a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 3: [234.5, 235.5) Step: 1e-05

long int lroundl(long double a)

Parameter 1 Domain 1: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 3: [234.5, 235.5) Step: 1e-05

double nearbyint(double a)

Parameter 1 Domain 1: [-1.4999, -0.5) Step: 1e-05

Parameter 1 Domain 2: (-24.49999, -23.5) Step: 1e-05

Parameter 1 Domain 3: [233.5, 234.4999) Step: 1e-05

float nearbyintf(float a)

Parameter 1 Domain 1: [-1.4999, -0.5) Step: 1e-05

Parameter 1 Domain 2: (-24.49999, -23.5) Step: 1e-05

Parameter 1 Domain 3: [233.5, 234.4999) Step: 1e-05

long double nearbyintl(long double a)

Parameter 1 Domain 1: [-1.4999, -0.5) Step: 1e-05

Parameter 1 Domain 2: (-24.49999, -23.5) Step: 1e-05

Parameter 1 Domain 3: [233.5, 234.4999) Step: 1e-05

double nextafter(double a,double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

float nextafterf(float a,float b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

long double nextafterl(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

double nexttoward(double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

float nexttowardf(float a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

long double nexttowardl(long double a,long double b)

Parameter 1 Domain 1: [-10, 10] Step: 0.0001

Parameter 1 Domain 2: [100, 110] Step: 0.0001

Parameter 2 Domain 1: [11, 19] Step: 0.002

Parameter 2 Domain 2: [-10, 10.999] Step: 0.002

double pow(double a,double b)

Parameter 1 Domain 1: [1, 10] Step: 0.01

Parameter 1 Domain 2: (0, 1] Step: 0.0001

Parameter 1 Domain 3: [1, 10] Step: 0.01

Parameter 1 Domain 4: [10, 1000] Step: 0.01

Parameter 2 Domain 1: [1, 4] Step: 0.01

Parameter 2 Domain 2: [-1, 1] Step: 0.001

Parameter 2 Domain 3: [-10, -1] Step: 0.01

Parameter 2 Domain 4: [-10, 10] Step: 0.01

float powf(float a,float b)

Parameter 1 Domain 1: [1, 10] Step: 0.01

Parameter 2 Domain 1: [1, 4] Step: 0.01

long double powl(long double a,long double b)

Parameter 1 Domain 1: [1, 10] Step: 0.01

Parameter 1 Domain 2: (0, 1] Step: 0.0001

Parameter 1 Domain 3: [1, 10] Step: 0.01

Parameter 1 Domain 4: [10, 1000] Step: 0.01

Parameter 1 Domain 5: [9999.9, 10001.1] Step: 1e-05

Parameter 2 Domain 1: [1, 4] Step: 5e-05

Parameter 2 Domain 2: [-1, 1] Step: 5e-05

Parameter 2 Domain 3: [-10, -1] Step: 0.01

Parameter 2 Domain 4: [-10, 10] Step: 0.01

Parameter 2 Domain 5: [-10, 10] Step: 0.01

double remainder(double a,double b)

Parameter 1 Domain 1: [100, 100.1001] Step: 1e-05

Parameter 1 Domain 2: [1000, 1000.1001] Step: 1e-05

Parameter 2 Domain 1: [9.524, 10] Step: 0.0001

Parameter 2 Domain 2: [95.239, 99.999] Step: 0.0001

float remainderf(float a,float b)

Parameter 1 Domain 1: [100, 100.1001] Step: 0.0001

Parameter 1 Domain 2: [1000, 1000.1001] Step: 0.0001

Parameter 2 Domain 1: [9.524, 10] Step: 0.0001

Parameter 2 Domain 2: [95.239, 99.999] Step: 0.0001

long double remainderl(long double a,long double b)

Parameter 1 Domain 1: [7258.4115, 7258.5115] Step: 0.0001

Parameter 1 Domain 2: [-7258.5115, -7258.4115] Step: 0.0001

Parameter 2 Domain 1: [5100.15, 13833] Step: 0.005

Parameter 2 Domain 2: [5100.15, 13833] Step: 0.005

double rint(double a)

Parameter 1 Domain 1: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 2: [234, 234.4999) Step: 1e-05

float rintf(float a)

Parameter 1 Domain 1: [-0.5, 0.5) Step: Minimum float representable

Parameter 1 Domain 2: (-23.99999, -23) Step: Minimum float representable

Parameter 1 Domain 3: [234, 234.9999) Step: Minimum float representable

long double rintl(long double a)

Parameter 1 Domain 1: [-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 234.9999) Step: 1e-05

double round(double a)

Parameter 1 Domain 1: [-10000, 10000] Step: 1

Parameter 1 Domain 2: [-10000.1, 10000.1] Step: 1

Parameter 1 Domain 3: [-10000.2, 10000.2] Step: 1

Parameter 1 Domain 4: [-10000.3, 10000.3] Step: 1

Parameter 1 Domain 5: [-10000.4, 10000.4] Step: 1

Parameter 1 Domain 6: [-10000.6, 10000.6] Step: 1

Parameter 1 Domain 7: [-10000.7, 10000.7] Step: 1

Parameter 1 Domain 8: [-10000.8, 10000.8] Step: 1

Parameter 1 Domain 9: [-10000.9, 10000.9] Step: 1

Parameter 1 Domain 10: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 11: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 12: (-203.5, -202.5) Step: 1e-05

Parameter 1 Domain 13: (-2003.5, -2002.5) Step: 1e-05

Parameter 1 Domain 14: (-20003.5, -20002.5) Step: 1e-05

Parameter 1 Domain 15: (-200003.5, -200002.5) Step: 1e-05

Parameter 1 Domain 16: (-2000003.5, -2000002.5) Step: 1e-05

Parameter 1 Domain 17: (23.5, 24.5) Step: 1e-05

Parameter 1 Domain 18: (203.5, 204.5) Step: 1e-05

Parameter 1 Domain 19: (2003.5, 2004.5) Step: 1e-05

Parameter 1 Domain 20: (20003.5, 20004.5) Step: 1e-05

Parameter 1 Domain 21: (200003.5, 200004.5) Step: 1e-05

Parameter 1 Domain 22: (2000003.5, 2000004.5) Step: 1e-05

Parameter 1 Domain 23: [234.5, 235.5) Step: 1e-05

float roundf(float a)

Parameter 1 Domain 1: [-10000, 10000] Step: 1

Parameter 1 Domain 2: [-10000.1, 10000.1] Step: 1

Parameter 1 Domain 3: [-10000.2, 10000.2] Step: 1

Parameter 1 Domain 4: [-10000.3, 10000.3] Step: 1

Parameter 1 Domain 5: [-10000.4, 10000.4] Step: 1

Parameter 1 Domain 6: [-10000.6, 10000.6] Step: 1

Parameter 1 Domain 7: [-10000.7, 10000.7] Step: 1

Parameter 1 Domain 8: [-10000.8, 10000.8] Step: 1

Parameter 1 Domain 9: [-10000.9, 10000.9] Step: 1

Parameter 1 Domain 10: (-0.5, 0.5) Step: Minimum float representable

Parameter 1 Domain 11: (-23.5, -22.5) Step: Minimum float representable

Parameter 1 Domain 12: (-203.5, -202.5) Step: 0.001

Parameter 1 Domain 13: (-2003.5, -2002.5) Step: 0.001

Parameter 1 Domain 14: (-20003.5, -20002.5) Step: 0.001

Parameter 1 Domain 15: (23.5, 24.5) Step: 0.001

Parameter 1 Domain 16: (203.5, 204.5) Step: 0.001

Parameter 1 Domain 17: (2003.5, 2004.5) Step: 0.001

Parameter 1 Domain 18: (20003.5, 20004.5) Step: 0.001

Parameter 1 Domain 19: [234.5, 235.5) Step: Minimum float representable

long double roundl(long double a)

Parameter 1 Domain 1: [-10000, 10000] Step: 1

Parameter 1 Domain 2: [-10000.1, 10000.1] Step: 1

Parameter 1 Domain 3: [-10000.2, 10000.2] Step: 1

Parameter 1 Domain 4: [-10000.3, 10000.3] Step: 1

Parameter 1 Domain 5: [-10000.4, 10000.4] Step: 1

Parameter 1 Domain 6: [-10000.6, 10000.6] Step: 1

Parameter 1 Domain 7: [-10000.7, 10000.7] Step: 1

Parameter 1 Domain 8: [-10000.8, 10000.8] Step: 1

Parameter 1 Domain 9: [-10000.9, 10000.9] Step: 1

Parameter 1 Domain 10: (-0.5, 0.5) Step: 1e-05

Parameter 1 Domain 11: (-23.5, -22.5) Step: 1e-05

Parameter 1 Domain 12: (-203.5, -202.5) Step: 1e-05

Parameter 1 Domain 13: (-2003.5, -2002.5) Step: 1e-05

Parameter 1 Domain 14: (-20003.5, -20002.5) Step: 1e-05

Parameter 1 Domain 15: (-200003.5, -200002.5) Step: 1e-05

Parameter 1 Domain 16: (-2000003.5, -2000002.5) Step: 1e-05

Parameter 1 Domain 17: (23.5, 24.5) Step: 1e-05

Parameter 1 Domain 18: (203.5, 204.5) Step: 1e-05

Parameter 1 Domain 19: (2003.5, 2004.5) Step: 1e-05

Parameter 1 Domain 20: (20003.5, 20004.5) Step: 1e-05

Parameter 1 Domain 21: (200003.5, 200004.5) Step: 1e-05

Parameter 1 Domain 22: (2000003.5, 2000004.5) Step: 1e-05

Parameter 1 Domain 23: [234.5, 235.5) Step: 1e-05

double scalbn(double a,long int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 1e-05

Parameter 2 Domain 1: [0, 150] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

float scalbnf(float a,long int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 0.0001

Parameter 2 Domain 1: [0, 150] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

long double scalbnl(long double a,long int b)

Parameter 1 Domain 1: [0, 0.3] Step: 0.0001

Parameter 1 Domain 2: [-1, 1] Step: 1e-05

Parameter 2 Domain 1: [0, 150] Step: 1

Parameter 2 Domain 2: [-150, -1] Step: 1

int signbit(double a)

Parameter 1 Domain 1: [-100, 0) Step: 1e-06

Parameter 1 Domain 2: [0, 100] Step: 1e-05

double sin(double a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-07

float sinf(float a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-06

double sinh(double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

float sinhf(float a)

Parameter 1 Domain 1: [-20, 20] Step: Minimum float representable

long double sinhl(long double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

long double sinl(long double a)

Parameter 1 Domain 1: [-25.132741, 25.132741] Step: 1e-07

double sqrt(double a)

Parameter 1 Domain 1: [0, 10] Step: 1e-06

Parameter 1 Domain 2: [0, 10000] Step: 0.0001

float sqrtf(float a)

Parameter 1 Domain 1: [0, 10000] Step: 0.001

Parameter 1 Domain 2: [0, 10] Step: 1e-06

long double sqrtl(long double a)

Parameter 1 Domain 1: [0, 10000] Step: 0.0001

Parameter 1 Domain 2: [0, 10] Step: 1e-07

double tan(double a)

Parameter 1 Domain 1: (-1.5706963, 1.5706963) Step: 1e-07

Parameter 1 Domain 2: (1.5708963, 4.712289) Step: 1e-07

float tanf(float a)

Parameter 1 Domain 1: (-1.5697963, 1.5697963) Step: Minimum float representable

Parameter 1 Domain 2: (1.5717963, 4.711389) Step: Minimum float representable

double tanh(double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

float tanhf(float a)

Parameter 1 Domain 1: [-20, 20] Step: Minimum float representable

long double tanhl(long double a)

Parameter 1 Domain 1: [-20, 20] Step: 1e-06

long double tanl(long double a)

Parameter 1 Domain 1: (-1.5706963, 1.5697963) Step: 1e-07

Parameter 1 Domain 2: (1.5717963, 4.711389) Step: 1e-07

double tgamma(double a)

Parameter 1 Domain 1: (-10, -9.0001) Step: 1e-06

Parameter 1 Domain 2: (-8.9999, -8.001) Step: 1e-05

Parameter 1 Domain 3: (-7.9999, -7.001) Step: 1e-05

Parameter 1 Domain 4: (-6.9999, -6.001) Step: 1e-05

Parameter 1 Domain 5: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 6: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 7: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 8: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 9: [12, 20] Step: 0.001

float tgammaf(float a)

Parameter 1 Domain 1: (-10, -9.0001) Step: 1e-06

Parameter 1 Domain 2: (-8.9999, -8.001) Step: 1e-05

Parameter 1 Domain 3: (-7.9999, -7.001) Step: 1e-05

Parameter 1 Domain 4: (-6.9999, -6.001) Step: 1e-05

Parameter 1 Domain 5: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 6: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 7: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 8: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 9: [12, 20] Step: 0.001

long double tgammal(long double a)

Parameter 1 Domain 1: (-6.9999, -6.001) Step: 1e-05

Parameter 1 Domain 2: (-1.9999, -1.001) Step: 1e-05

Parameter 1 Domain 3: (-0.9999, -0.001) Step: 1e-05

Parameter 1 Domain 4: [0.0001, 10] Step: 1e-05

Parameter 1 Domain 5: [0.0001, 0.5] Step: 1e-07

Parameter 1 Domain 6: [12, 20] Step: 0.001

double trunc(double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 235) Step: 1e-05

float truncf(float a)

Parameter 1 Domain 1: (-0.999, 0) Step: Minimum float representable

Parameter 1 Domain 2: (-23.99999, -23) Step: Minimum float representable

Parameter 1 Domain 3: [234, 235) Step: 1e-05

long double truncl(long double a)

Parameter 1 Domain 1: (-0.999, 0) Step: 1e-05

Parameter 1 Domain 2: (-23.99999, -23) Step: 1e-05

Parameter 1 Domain 3: [234, 235) Step: 1e-05

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