

NAME

log, logf, logl – natural logarithmic function

SYNOPSIS

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

```
double log(double x);
```

```
float logf(float x);
```

```
long double logl(long double x);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see [feature_test_macros\(7\)](#)):

```
logf(), logl():
```

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L || /* Since glibc 2.19: */ _DE-  
FAULT_SOURCE || /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

DESCRIPTION

These functions return the natural logarithm of x .

RETURN VALUE

On success, these functions return the natural logarithm of x .

If x is a NaN, a NaN is returned.

If x is 1, the result is +0.

If x is positive infinity, positive infinity is returned.

If x is zero, then a pole error occurs, and the functions return `-HUGE_VAL`, `-HUGE_VALF`, or `-HUGE_VALL`, respectively.

If x is negative (including negative infinity), then a domain error occurs, and a NaN (not a number) is returned.

ERRORS

See [math_error\(7\)](#) for information on how to determine whether an error has occurred when calling these functions.

The following errors can occur:

Domain error: x is negative

`errno` is set to **EDOM**. An invalid floating-point exception (**FE_INVALID**) is raised.

Pole error: x is zero

`errno` is set to **ERANGE**. A divide-by-zero floating-point exception (**FE_DIVBYZERO**) is raised.

ATTRIBUTES

For an explanation of the terms used in this section, see [attributes\(7\)](#).

Interface	Attribute	Value
<code>log()</code> , <code>logf()</code> , <code>logl()</code>	Thread safety	MT-Safe

CONFORMING TO

C99, POSIX.1-2001, POSIX.1-2008.

The variant returning *double* also conforms to SVr4, 4.3BSD, C89.

BUGS

In glibc 2.5 and earlier, taking the `log()` of a NaN produces a bogus invalid floating-point (**FE_INVALID**) exception.

SEE ALSO

[cbrt\(3\)](#), [clog\(3\)](#), [log10\(3\)](#), [log1p\(3\)](#), [log2\(3\)](#), [sqrt\(3\)](#)

COLOPHON

This page is part of release 4.16 of the Linux *man-pages* project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.