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
log(), **logf**(), **logl**()	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/.