

**NAME**

`log1p`, `log1pf`, `log1pl` - logarithm of 1 plus argument

**SYNOPSIS**

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

```
double log1p(double x);
float log1pf(float x);
long double log1pl(long double x);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see [feature\\_test\\_macros\(7\)](#)):

`log1p()`:

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 500 ||
_XOPEN_SOURCE && _XOPEN_SOURCE_EXTENDED || _ISOC99_SOURCE ||
_POSIX_C_SOURCE >= 200112L;
or cc -std=c99
```

`log1pf()`, `log1pl()`:

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 600 || _ISOC99_SOURCE ||
_POSIX_C_SOURCE >= 200112L;
or cc -std=c99
```

**DESCRIPTION**

$\log_1 p(x)$  returns a value equivalent to

$\log(1 + x)$

It is computed in a way that is accurate even if the value of  $x$  is near zero.

**RETURN VALUE**

On success, these functions return the natural logarithm of  $(1 + x)$ .

If  $x$  is a NaN, a NaN is returned.

If  $x$  is positive infinity, positive infinity is returned.

If  $x$  is -1, a pole error occurs, and the functions return `-HUGE_VAL`, `-HUGE_VALF`, or `-HUGE_VALL`, respectively.

If  $x$  is less than -1 (including negative infinity), 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 less than -1

An invalid floating-point exception (`FE_INVALID`) is raised.

Pole error:  $x$  is -1

A divide-by-zero floating-point exception (`FE_DIVBYZERO`) is raised.

These functions do not set `errno`.

**ATTRIBUTES**

**Multithreading** (see [pthreads\(7\)](#))

The `log1p()`, `log1pf()`, and `log1pl()` functions are thread-safe.

**CONFORMING TO**

C99, POSIX.1-2001.

**SEE ALSO**

[exp\(3\)](#), [expm1\(3\)](#), [log\(3\)](#)

**COLOPHON**

This page is part of release 3.74 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 <http://www.kernel.org/doc/man-pages/>.