

NAME

erf, erff, erfl, - error function

SYNOPSIS

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

```
double erf(double x);
```

```
float erff(float x);
```

```
long double erfl(long double x);
```

Link with *-lm*.

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

erf():

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE || _ISOC99_SOURCE ||
```

```
_POSIX_C_SOURCE >= 200112L;
```

```
or cc -std=c99
```

erff(), **erfl()**:

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 600 || _ISOC99_SOURCE ||
```

```
_POSIX_C_SOURCE >= 200112L;
```

```
or cc -std=c99
```

DESCRIPTION

The **erf()** function returns the error function of *x*, defined as

$$\operatorname{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x \exp(-t^2) dt$$
RETURN VALUE

On success, these functions return the error function of *x*, a value in the range [-1, 1].

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

If *x* is +0 (-0), +0 (-0) is returned.

If *x* is positive infinity (negative infinity), +1 (-1) is returned.

If *x* is subnormal, a range error occurs, and the return value is $2^*x/\sqrt{\pi}$.

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:

Range error: result underflow (*x* is subnormal)

An underflow floating-point exception (**FE_UNDERFLOW**) is raised.

These functions do not set *errno*.

ATTRIBUTES

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

The **erf()**, **erff()**, and **erfl()** functions are thread-safe.

CONFORMING TO

C99, POSIX.1-2001. The variant returning *double* also conforms to SVr4, 4.3BSD.

SEE ALSO

[cerf\(3\)](#), [erfc\(3\)](#), [exp\(3\)](#)

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/>.