

NAME

erfc, erfcf, erfc1 – complementary error function

LIBRARY

Math library (*libm*, *-lm*)

SYNOPSIS

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

```
double erfc(double x);
```

```
float erfcf(float x);
```

```
long double erfc1(long double x);
```

Feature Test Macro Requirements for glibc (see **feature_test_macros(7)**):

```
erfc():
```

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L || _XOPEN_SOURCE
    /* Since glibc 2.19: */ _DEFAULT_SOURCE
    /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

```
erfcf(), erfc1():
```

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    /* Since glibc 2.19: */ _DEFAULT_SOURCE
    /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

DESCRIPTION

These functions return the complementary error function of x , that is, $1.0 - \text{erf}(x)$.

RETURN VALUE

On success, these functions return the complementary error function of x , a value in the range $[0,2]$.

If x is a NaN, a NaN is returned.

If x is $+0$ or -0 , 1 is returned.

If x is positive infinity, $+0$ is returned.

If x is negative infinity, $+2$ is returned.

If the function result underflows and produces an unrepresentable value, the return value is 0.0.

If the function result underflows but produces a representable (i.e., subnormal) value, that value is returned, and a range error occurs.

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 (result is subnormal)

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

These functions do not set *errno*.

ATTRIBUTES

For an explanation of the terms used in this section, see **attributes(7)**.

Interface	Attribute	Value
erfc() , erfcf() , erfc1()	Thread safety	MT-Safe

STANDARDS

C11, POSIX.1-2008.

HISTORY

C99, POSIX.1-2001.

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

NOTES

The **erfc()**, **erfcf()**, and **erfcl()** functions are provided to avoid the loss accuracy that would occur for the calculation $1-\text{erf}(x)$ for large values of x (for which the value of $\text{erf}(x)$ approaches 1).

SEE ALSO

cerf(3), **erf(3)**, **exp(3)**