

**NAME**

erfc, erfcf, erfcf – complementary error function

**SYNOPSIS**

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

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

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

```
long double erfcf(long double x);
```

Link with `-lm`.

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 versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

**erfcf(), erfcf()**:

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
```

```
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
|| /* Glibc versions <= 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
<b>erfc(), erfcf(), erfcf()</b>	Thread safety	MT-Safe

**CONFORMING TO**

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

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

**NOTES**

The **erfc()**, **erfcf()**, and **erfcf()** 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)**

**COLOPHON**

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