NAME

fma, fmaf, fmal - floating-point multiply and add

SYNOPSIS

#include <math.h>

double fma(double *x*, **double** *y*, **double** *z*);
float fmaf(float *x*, **float** *y*, **float** *z*);
long double fmal(long double *x*, **long double** *y*, **long double** *z*);

Link with *-lm*.

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

fma(), **fmaf**(), **fmal**():
_XOPEN_SOURCE >= 600 || _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L;
or *cc -std=c99*

DESCRIPTION

The **fma**() function computes *x* * *y* + *z*. The result is rounded as one ternary operation according to the current rounding mode (see fenv(3)).

RETURN VALUE

These functions return the value of *x* * *y* + *z*, rounded as one ternary operation.

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

If *x* times *y* is an exact infinity, and *z* is an infinity with the opposite sign, a domain error occurs, and a NaN is returned.

If one of *x* or *y* is an infinity, the other is 0, and *z* is not a NaN, a domain error occurs, and a NaN is returned.

If one of *x* or *y* is an infinity, and the other is 0, and *z* is a NaN, a domain error occurs, and a NaN is returned.

If *x* times *y* is not an infinity times zero (or vice versa), and *z* is a NaN, a NaN is returned.

If the result overflows, a range error occurs, and an infinity with the correct sign is returned.

If the result underflows, a range error occurs, and a signed 0 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* * *y* + *z*, or *x* * *y* is invalid and *z* is not a NaN
An invalid floating-point exception (**FE_INVALID**) is raised.

Range error: result overflow
An overflow floating-point exception (**FE_OVERFLOW**) is raised.

Range error: result underflow
An underflow floating-point exception (**FE_UNDERFLOW**) is raised.

These functions do not set *errno*.

VERSIONS

These functions first appeared in glibc in version 2.1.

ATTRIBUTES

Multithreading (see pthreads(7))

The **fma**(), **fmaf**(), and **fmal**() functions are thread-safe.

CONFORMING TO

C99, POSIX.1-2001.

SEE ALSO

remainder(3), remquo(3)

COLOPHON

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