NAME

cosh, coshf, coshl - hyperbolic cosine function

SYNOPSIS

#include <math.h>

double cosh(double x**);**
float coshf(float x**);**
long double coshl(long double x**);**

Link with *-lm*.

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

coshf(), **coshl**():
    _BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 600 || _ISOC99_SOURCE ||
    _POSIX_C_SOURCE >= 200112L;
    or *cc -std=c99*

DESCRIPTION

The **cosh**() function returns the hyperbolic cosine of x, which is defined mathematically as:

cosh(x) = (exp(x) + exp(-x)) / 2

RETURN VALUE

On success, these functions return the hyperbolic cosine of x.

If x is a NaN, a NaN is returned.

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

If x is positive infinity or negative infinity, positive infinity is returned.

If the result overflows, a range error occurs, and the functions return +**HUGE_VAL**, +**HUGE_VALF**, or +**HUGE_VALL**, respectively.

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 overflow
        errno is set to **ERANGE**. An overflow floating-point exception (**FE_OVERFLOW**) is raised.

CONFORMING TO

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

BUGS

In glibc version 2.3.4 and earlier, an overflow floating-point (**FE_OVERFLOW**) exception is not raised when an overflow occurs.

SEE ALSO

acosh(3), asinh(3), atanh(3), ccos(3), sinh(3), tanh(3)

COLOPHON

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