NAME

hypot, hypotf, hypotl − Euclidean distance function

LIBRARY

Math library (*libm*, *−lm*)

SYNOPSIS

```
#include <math.h>

double hypot(double x, double y);
float hypotf(float x, float y);
long double hypotl(long double x, long double y);
```

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

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

hypotf(), **hypotl**():
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
|| /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE

DESCRIPTION

These functions return sqrt(*x***x*+*y***y*). This is the length of the hypotenuse of a right-angled triangle with sides of length *x* and *y*, or the distance of the point (*x*,*y*) from the origin.

The calculation is performed without undue overflow or underflow during the intermediate steps of the calculation.

RETURN VALUE

On success, these functions return the length of the hypotenuse of a right-angled triangle with sides of length *x* and *y*.

If *x* or *y* is an infinity, positive infinity is returned.

If *x* or *y* is a NaN, and the other argument is not an infinity, a NaN is returned.

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

If both arguments are subnormal, and the result is subnormal, a range error occurs, and the correct result 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:

Range error: result overflow
errno is set to **ERANGE**. 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* for this case.

ATTRIBUTES

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

Interface	Attribute	Value
hypot(), **hypotf**(), **hypotl**()	Thread safety	MT-Safe

STANDARDS

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

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

SEE ALSO

cabs(3), **sqrt**(3)