C++

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Reference

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<cmath> (math.h)

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header

<cmath> (math.h)

C numerics library

Header <cmath> declares a set of functions to compute common mathematical operations and transformations:

Functions

Trigonometric functions

cos	Compute cosine (function)
sin	Compute sine (function)
tan	Compute tangent (function)
acos	Compute arc cosine (function)
asin	Compute arc sine (function)
atan	Compute arc tangent (function)
atan2	Compute arc tangent with two parameters (function)

Hyperbolic functions

cosh	Compute hyperbolic cosine (function)
sinh	Compute hyperbolic sine (function)
tanh	Compute hyperbolic tangent (function)
acosh	Compute arc hyperbolic cosine (function)
asinh	Compute arc hyperbolic sine (function)
atanh	Compute arc hyperbolic tangent (function)

Exponential and logarithmic functions

exp	Compute exponential function (function)
frexp	Get significand and exponent (function)
ldexp	Generate value from significand and exponent (function)
log	Compute natural logarithm (function)
log10	Compute common logarithm (function)
modf	Break into fractional and integral parts (function)
exp2	Compute binary exponential function (function)
expm1	Compute exponential minus one (function)
ilogb	Integer binary logarithm (function)
log1p	Compute logarithm plus one (function)
log2	Compute binary logarithm (function)
logb	Compute floating-point base logarithm (function)
scalbn	Scale significand using floating-point base exponent (function)
scalbln	Scale significand using floating-point base exponent (long) (function)

Power functions

pow	Raise to power (function)
sqrt	Compute square root (function)
cbrt	Compute cubic root (function)
hypot	Compute hypotenuse (function)

Error and gamma functions

erf	Compute error function (function)
erfc	Compute complementary error function (function)
tgamma	Compute gamma function (function)
lgamma	Compute log-gamma function (function)

Rounding and remainder functions

ceil	Round up value (function)
floor	Round down value (function)
fmod	Compute remainder of division (function)
trunc	Truncate value (function)
round	Round to nearest (function)

lround	Round to nearest and cast to long integer (function)
llround	Round to nearest and cast to long long integer (function)
rint	Round to integral value (function)
lrint	Round and cast to long integer (function)
llrint	Round and cast to long long integer (function)
nearbyint	Round to nearby integral value (function)
remainder	Compute remainder (IEC 60559) (function)
remquo	Compute remainder and quotient (function)

Floating-point manipulation functions

copysign	Copy sign (function)
nan	Generate quiet NaN (function)
nextafter	Next representable value (function)
nexttoward	Next representable value toward precise value (function)

Minimum, maximum, difference functions

fdim	Positive difference (function)
fmax	Maximum value (function)
fmin	Minimum value (function)

Other functions

fabs	Compute absolute value (function)
abs	Compute absolute value (function)
fma	Multiply-add (function)

Macros / Functions

These are implemented as macros in C and as functions in C++:

Classification macro / functions

fpclassify	Classify floating-point value (macro/function)
isfinite	Is finite value (macro)
isinf	Is infinity (macro/function)
isnan	Is Not-A-Number (macro/function)
isnormal	Is normal (macro/function)
signbit	Sign bit (macro/function)

Comparison macro / functions

isgreater	Is greater (macro)
isgreaterequal	Is greater or equal (macro)
isless	Is less (macro)
islessequal	Is less or equal (macro)
islessgreater	Is less or greater (macro)
isunordered	Is unordered (macro)

Macro constants

math_errhandling	Error handling (macro)
INFINITY	Infinity (constant)
NAN	Not-A-Number (constant)
HUGE_VAL	Huge value (constant)
HUGE_VALF	Huge float value
HUGE_VALL	Huge long double value (constant)

This header also defines the following macro constants (since C99/C++11):

macro	type	description
`MATH_ERRNO` `MATH_ERREXCEPT`	`int`	Bitmask value with the possible values `math_errhandling` can take.

`FP_FAST_FMA`
`FP_FAST_FMAF`
`FP_FAST_FMAL`
	`int`	Each, if defined, identifies for which type `fma` is at least as efficient as `x*y+z`.

`FP_INFINITE`
`FP_NAN`
`FP_NORMAL`
`FP_SUBNORMAL`
`FP_ZERO`
	`int`	The possible values returned by `fpclassify`.

`FP_ILOGB0`	`int`	Special values the `ilogb` function may return.

FP_ILOGBNAN		

Types

double_t	Floating-point type (type)
float_t	Floating-point type (type)