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### ***Rocky Enterprise Linux 9.2 Manual Pages on command 'coshl.3'***

#### ***\$ man coshl.3***

COSH(3)                      Linux Programmer's Manual                      COSH(3)

#### 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():

```
_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 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.

## ATTRIBUTES

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

??

?Interface           ? Attribute   ? Value   ?

??

?`cosh()`, `coshf()`, `coshl()` ? Thread safety ? MT-Safe ?

??

## CONFORMING TO

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

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

This page is part of release 5.10 of the Linux man-pages project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at <https://www.kernel.org/doc/man-pages/>.