



## ***Red Hat Enterprise Linux Release 9.2 Manual Pages on 'atanhl.3' command***

**\$ man atanh.3**

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

### NAME

atanh, atanhf, atanh1 - inverse hyperbolic tangent function

### SYNOPSIS

```
#include <math.h>
```

```
double atanh(double x);
```

```
float atanhf(float x);
```

```
long double atanh1(long double x);
```

Link with -lm.

Feature Test Macro Requirements for glibc (see feature\_test\_macros(7)):

atanh():

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
```

```
|| _XOPEN_SOURCE >= 500
```

```
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
|| /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

atanhf(), atanh1():

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
```

```
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
|| /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

### DESCRIPTION

These functions calculate the inverse hyperbolic tangent of x; that is the value whose hyperbolic tangent is x.

### RETURN VALUE

On success, these functions return the inverse hyperbolic tangent of x.  
If x is a NaN, a NaN is returned.  
If x is +0 (-0), +0 (-0) is returned.  
If x is +1 or -1, a pole error occurs, and the functions return HUGE\_VAL, HUGE\_VALF, or HUGE\_VALL, respectively, with the mathematically correct sign.  
If the absolute value of x is greater than 1, a domain error occurs, and a NaN 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 less than -1 or greater than +1

errno is set to EDOM. An invalid floating-point exception (FE\_INVALID) is raised.

Pole error: x is +1 or -1

errno is set to ERANGE (but see BUGS). A divide-by-zero floating-point exception (FE\_DIVBYZERO) is raised.

## ATTRIBUTES

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

??

?Interface            ? Attribute   ? Value ?

??

?atanh(), atanhf(), atanhll() ? 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 2.9 and earlier, when a pole error occurs, errno is set to EDOM instead of the POSIX-mandated ERANGE. Since version 2.10, glibc does the right thing.

## SEE ALSO

`acosh(3)`, `asinh(3)`, `catanh(3)`, `cosh(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/>.

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