



Red Hat Enterprise Linux Release 9.2 Manual Pages on 'atanh.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 mathemati?

cally 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 float?

 floating-point exception (`FE_DIVBYZERO`) is raised.

ATTRIBUTES

For an explanation of the terms used in this section, see `at?`

`tributes(7)`.

??

?Interface ? Attribute ? Value ?

??

?`atanh()`, `atanhf()`, `atanhl()` ? 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` as 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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