



Linux Ubuntu 26.04 Manual Pages on command 'catanhf.3'

\$ man catanhf.3

catanh(3) Library Functions Manual catanh(3)

NAME

catanh, catanhf, catanhl - complex arc tangents hyperbolic

LIBRARY

Math library (libm, -lm)

SYNOPSIS

```
#include <complex.h>

double complex catanh(double complex z);

float complex catanhf(float complex z);

long double complex catanhl(long double complex z);
```

DESCRIPTION

These functions calculate the complex arc hyperbolic tangent of z. If $y = \operatorname{catanh}(z)$, then $z = \operatorname{ctanh}(y)$. The imaginary part of y is chosen in the interval $[-\pi/2, \pi/2]$.

One has:

$$\operatorname{catanh}(z) = 0.5 * (\operatorname{clog}(1 + z) - \operatorname{clog}(1 - z))$$

ATTRIBUTES

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

??

? Interface	? Attribute	? Value	?
catanh(), catanhf(), catanhl()	Thread safety	MT-Safe	?

??

STANDARDS

C11, POSIX.1-2008.

HISTORY

glibc 2.1. C99, POSIX.1-2001.

EXAMPLES

```
/* Link with "-lm" */

#include <complex.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int

main(int argc, char *argv[])
{
    double complex z, c, f;

    if (argc != 3) {
        fprintf(stderr, "Usage: %s <real> <imag>\n", argv[0]);
        exit(EXIT_FAILURE);
    }

    z = atof(argv[1]) + atof(argv[2]) * I;
    c = catanh(z);

    printf("catanh() = %6.3f %6.3f*i\n", creal(c), cimag(c));
    f = 0.5 * (clog(1 + z) - clog(1 - z));
    printf("formula = %6.3f %6.3f*i\n", creal(f), cimag(f));
    exit(EXIT_SUCCESS);
}
```

SEE ALSO

[atanh\(3\)](#), [cabs\(3\)](#), [cimag\(3\)](#), [ctanh\(3\)](#), [complex\(7\)](#)

Linux man-pages 6.17

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[catanh\(3\)](#)