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

**\$ man catanh.3**

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

**NAME**

catanh, catanhf, catanhI - complex arc tangents hyperbolic

**SYNOPSIS**

```
#include <complex.h>

double complex catanh(double complex z);

float complex catanhf(float complex z);

long double complex catanhI(long double complex z);

Link with -lm.
```

**DESCRIPTION**

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

One has:

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

**VERSIONS**

These functions first appeared in glibc in version 2.1.

**ATTRIBUTES**

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

??

?Interface                      ? Attribute    ? Value    ?

??

?catanh(), catanhf(), catanhI() ? Thread safety ? MT-Safe ?

??

## CONFORMING TO

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

## EXAMPLES

```
/* Link with "-lm" */
#include <complex.h>
#include <stdlib.h>
#include <unistd.h>
#include <stdio.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(f2), cimag(f2));
    exit(EXIT_SUCCESS);
}
```

## SEE ALSO

atanh(3), cabs(3), cimag(3), ctanh(3), complex(7)

## 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/>.