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

***\$ man tanh.3p***

TANH(3P)                    POSIX Programmer's Manual                    TANH(3P)

### PROLOG

This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

### NAME

tanh, tanhf, tanhl ? hyperbolic tangent functions

### SYNOPSIS

```
#include <math.h>

double tanh(double x);

float tanhf(float x);

long double tanhl(long double x);
```

### DESCRIPTION

The functionality described on this reference page is aligned with the ISO C standard. Any conflict between the requirements described here and the ISO C standard is unintentional. This volume of POSIX.1?2017 defers to the ISO C standard.

These functions shall compute the hyperbolic tangent of their argument x.

An application wishing to check for error situations should set errno to zero and call feclearexcept(FE\_ALL\_EXCEPT) before calling these functions. On return, if errno is non-zero or fetestexcept(FE\_INVALID |

FE\_DIVBYZERO | FE\_OVERFLOW | FE\_UNDERFLOW) is non-zero, an error has occurred.

## RETURN VALUE

Upon successful completion, these functions shall return the hyperbolic tangent of  $x$ .

If  $x$  is NaN, a NaN shall be returned.

If  $x$  is  $\pm 0$ ,  $x$  shall be returned.

If  $x$  is  $\pm \text{Inf}$ ,  $\pm 1$  shall be returned.

If  $x$  is subnormal, a range error may occur and  $x$  should be returned.

If  $x$  is not returned,  $\tanh()$ ,  $\tanhf()$ , and  $\tanhl()$  shall return an implementation-defined value no greater in magnitude than `DBL_MIN`, `FLT_MIN`, and `LDBL_MIN`, respectively.

## ERRORS

These functions may fail if:

Range Error The value of  $x$  is subnormal.

If the integer expression `(math_errhandling & MATH_ERRNO)` is non-zero, then `errno` shall be set to `[ERANGE]`. If the integer expression `(math_errhandling & MATH_ERREXCEPT)` is non-zero, then the underflow floating-point exception shall be raised.

The following sections are informative.

## EXAMPLES

None.

## APPLICATION USAGE

On error, the expressions `(math_errhandling & MATH_ERRNO)` and `(math_errhandling & MATH_ERREXCEPT)` are independent of each other, but at least one of them must be non-zero.

## RATIONALE

None.

## FUTURE DIRECTIONS

None.

## SEE ALSO

atanh(), feclereexcept(), fetestexcept(), isnan(), tan()

The Base Definitions volume of POSIX.1-2017, Section 4.20, Treatment of Error Conditions for Mathematical Functions, <math.h>

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