The Cygnus C Math Library

`libm` 1.4
May 1993

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Table of Contents

1 Reentrancy Properties of `libm` 1

Index 3

1 Reentrancy Properties of `libm`

When a math function detects an error, it sets the static variable `errno`. Depending upon the severity of the error, it may also print a message to `stderr`. None of this behavior is reentrant. When one process detects an error, it sets `errno`. If another process is testing `errno`, it detects the change and probably fails. Note that failing system calls can also set `errno`. This problem can only be fixed by either ignoring `errno`, or treating it as part of the context of a process and switching it along with the rest of a processor state. In normal debugged programs, there are usually no math subroutine errors—and therefore no `matherr` calls; in that situation, the math functions behave reentrantly.

As an alternative, you can use the reentrant versions of the mathematical functions: these versions have a different name, normally formed by prepending '`_`' and appending '`_r`', and use an extra argument—a pointer to the particular reentrancy structure to use. See section "Reentrancy" in *The Cygnus C Support Library*, for more discussion of this approach to reentrancy.

The reentrancy structure is always an additional first argument; for example, the reentrant version of '`double acos (double x)`' is '`double _acos_r (void *reent, double x)`'.

Here is a list of the names for reentrant versions of the mathematical library functions:

```
_acos_r          _gammaf_r_r      _log10f_r
_acosf_r         _hypot_r         _log_r
_acosh_r         _hypotf_r        _logf_r
_acoshf_r        _j0_r            _pow_r
_asin_r          _j0f_r           _powf_r
_asinf_r         _j1_r            _remainder_r
_atanh_r         _j1f_r           _sinh_r
_atanhf_r        _jn_r            _sinhf_r
_cosh_r          _jnf_r           _sqrt_r
_coshf_r         _ldexp_r         _sqrtf_r
_exp_r           _ldexpf_r        _y0_r
_expf_r          _lgamma_r        _y0f_r
_fmod_r          _lgamma_r_r      _y1_r
_fmodf_r         _lgammaf_r       _y1f_r
_gamma_r         _lgammaf_r_r     _yn_r
_gamma_r_r       _log10_r         _ynf_r
_gammaf_r
```

Index

M

`matherr` and reentrancy 1

R

reentrancy 1

The body of this manual is set in
pncr at 10.95pt,
with headings in **pncb at 10.95pt**
and examples in pcrr.
pncri at 10.95pt and
pcrro
are used for emphasis.