



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

\$ man yn.3

y0(3) Library Functions Manual y0(3)

NAME

y0, y0f, y0l, y1, y1f, y1l, yn, ynf, ynl - Bessel functions of the second kind

LIBRARY

Math library (libm, -lm)

SYNOPSIS

```
#include <math.h>

double y0(double x);

double y1(double x);

double yn(int n, double x);

float y0f(float x);

float y1f(float x);

float ynf(int n, float x);

long double y0l(long double x);

long double y1l(long double x);

long double ynl(int n, long double x);
```

Feature Test Macro Requirements for glibc (see feature_test_macros(7)):

y0(), y1(), yn():

```
_XOPEN_SOURCE
```

```
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
|| /* glibc <= 2.19: */ _SVID_SOURCE || _BSD_SOURCE
```

y0f(), y0l(), y1f(), y1l(), ynf(), ynl():

```
_XOPEN_SOURCE >= 600
```

```

|| (_ISOC99_SOURCE && _XOPEN_SOURCE)
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
|| /* glibc <= 2.19: */ _SVID_SOURCE || _BSD_SOURCE

```

DESCRIPTION

The `y0()` and `y1()` functions return Bessel functions of `x` of the second kind of orders 0 and 1, respectively. The `yn()` function returns the Bessel function of `x` of the second kind of order `n`.

The value of `x` must be positive.

The `y0f()`, `y1f()`, and `ynf()` functions are versions that take and return float values. The `y0l()`, `y1l()`, and `ynl()` functions are versions that take and return long double values.

RETURN VALUE

On success, these functions return the appropriate Bessel value of the second kind for `x`.

If `x` is a NaN, a NaN is returned.

If `x` is negative, a domain error occurs, and the functions return `-HUGE_VAL`, `-HUGE_VALF`, or `-HUGE_VALL`, respectively. (POSIX.1-2001 also allows a NaN return for this case.)

If `x` is 0.0, a pole error occurs, and the functions return `-HUGE_VAL`, `-HUGE_VALF`, or `-HUGE_VALL`, respectively.

If the result underflows, a range error occurs, and the functions return 0.0

If the result overflows, a range error occurs, and the functions return `-HUGE_VAL`, `-HUGE_VALF`, or `-HUGE_VALL`, respectively. (POSIX.1-2001 also allows a 0.0 return for this case.)

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` is negative

`errno` is set to `EDOM`. An invalid floating-point exception (`FE_INVALID`) is raised.

Pole error: `x` is 0.0

`errno` is set to `ERANGE` and an `FE_DIVBYZERO` exception is raised (but see BUGS).

Range error: result underflow

`errno` is set to `ERANGE`. No `FE_UNDERFLOW` exception is returned by `fetestexcept(3)` for this case.

Range error: result overflow

