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### ***Rocky Enterprise Linux 9.2 Manual Pages on command 'j0.3'***

**\$ man j0.3**

J0(3)                      Linux Programmer's Manual                      J0(3)

NAME

j0, j0f, j0l, j1, j1f, j1l, jn, jnf, jnl - Bessel functions of the first kind

SYNOPSIS

```
#include <math.h>

double j0(double x);
double j1(double x);
double jn(int n, double x);
float j0f(float x);
float j1f(float x);
float jnf(int n, float x);
long double j0l(long double x);
long double j1l(long double x);
long double jnl(int n, long double x);

Link with -lm.
```

Feature Test Macro Requirements for glibc (see feature\_test\_macros(7)):

```
j0(), j1(), jn():
    _XOPEN_SOURCE
    || /* Since glibc 2.19: */ _DEFAULT_SOURCE
    || /* Glibc versions <= 2.19: */ _SVID_SOURCE || _BSD_SOURCE

j0f(), j0l(), j1f(), j1l(), jnf(), jnl():
    _XOPEN_SOURCE >= 600
    || (_ISOC99_SOURCE && _XOPEN_SOURCE)
```

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

```
|| /* Glibc versions <= 2.19: */ _SVID_SOURCE || _BSD_SOURCE
```

## DESCRIPTION

The  $j_0()$  and  $j_1()$  functions return Bessel functions of  $x$  of the first kind of orders 0 and 1, respectively. The  $j_n()$  function returns the Bessel function of  $x$  of the first kind of order  $n$ .

The  $j_0f()$ ,  $j_1f()$ , and  $jnf()$ , functions are versions that take and return float values.

The  $j_0l()$ ,  $j_1l()$ , and  $jnl()$  functions are versions that take and return long double values.

## RETURN VALUE

On success, these functions return the appropriate Bessel value of the first kind for  $x$ .

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

If  $x$  is too large in magnitude, or the result underflows, a range error occurs, and the return value is 0.

## 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:

Range error: result underflow, or  $x$  is too large in magnitude

`errno` is set to `ERANGE`.

These functions do not raise exceptions for `fetestexcept(3)`.

## ATTRIBUTES

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

??

?Interface ? Attribute ? Value ?

??

? $j_0()$ ,  $j_0f()$ ,  $j_0l()$  ? Thread safety ? MT-Safe ?

??

? $j_1()$ ,  $j_1f()$ ,  $j_1l()$  ? Thread safety ? MT-Safe ?

??

? $j_n()$ ,  $jnf()$ ,  $jnl()$  ? Thread safety ? MT-Safe ?

??

## CONFORMING TO

The functions returning double conform to SVr4, 4.3BSD, POSIX.1-2001, and POSIX.1-2008.

The others are nonstandard functions that also exist on the BSDs.

## BUGS

There are errors of up to  $2e-16$  in the values returned by `j0()`, `j1()`, and `jn()` for values of `x` between -8 and 8.

## SEE ALSO

`y0(3)`

## 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/>.

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