

**NAME**

**j0, j0f, j1, j1f, jn, jnf, y0, y0f, y1, y1f, yn, ynf** - Bessel functions of first and second kind

**LIBRARY**

Math Library (libm, -lm)

**SYNOPSIS**

**#include <math.h>**

*double*

**j0**(*double x*);

*float*

**j0f**(*float x*);

*double*

**j1**(*double x*);

*float*

**j1f**(*float x*);

*double*

**jn**(*int n, double x*);

*float*

**jnf**(*int n, float x*);

*double*

**y0**(*double x*);

*float*

**y0f**(*float x*);

*double*

**y1**(*double x*);

*float*

**y1f**(*float x*);

*double*

**yn**(*int n, double x*);

*float*

**ynf**(*int n, float x*);

## DESCRIPTION

The functions **j0()**, **j0f()**, **j1()**, and **j1f()** compute the Bessel function of the first kind of orders 0 and 1 for the real value *x*; the functions **jn()** and **jnf()** compute the Bessel function of the first kind of the integer order *n* for the real value *x*.

The functions **y0()**, **y0f()**, **y1()**, and **y1f()** compute the linearly independent Bessel function of the second kind of orders 0 and 1 for the positive *real* value *x*; the functions **yn()** and **ynf()** compute the Bessel function of the second kind for the integer order *n* for the positive *real* value *x*.

## RETURN VALUES

These routines return values of their respective Bessel functions. For large positive inputs, they may underflow and return +-0.

The following applies to **y0()**, **y0f()**, **y1()**, **y1f()**, **yn()**, and **ynf()**. If *x* is negative, including -infinity, these routines will generate an invalid exception and return NaN. If *x* is +-0, these routines will generate a divide-by-zero exception and return -infinity. If *x* is a sufficiently small positive number, then **y1()**, **y1f()**, **yn()**, and **ynf()** will generate an overflow exception and return -infinity.

## SEE ALSO

math(3)

## STANDARDS

The **j0()**, **j1()**, **jn()**, **y0()**, **y1()**, and **yn()** functions conform to IEEE Std 1003.1-2001 ("POSIX.1"). The *float* versions are extensions.

## HISTORY

This set of functions appeared in Version 7 AT&T UNIX.