NAME

fpclassify, isfinite, isnormal, isnan, isinf − floating-point classification macros

LIBRARY

Math library (*libm*, −*lm*)

SYNOPSIS

```
#include <math.h>

int fpclassify(x);
int isfinite(x);
int isnormal(x);
int isnan(x);
int isinf(x);
```

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

fpclassify(), **isfinite**(), **isnormal**():
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L

isnan():
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
|| _XOPEN_SOURCE
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
|| /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE

isinf():
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
|| /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE

DESCRIPTION

Floating point numbers can have special values, such as infinite or NaN. With the macro **fpclassify(***x***)** you can find out what type *x* is. The macro takes any floating-point expression as argument. The result is one of the following values:

FP_NAN *x* is "Not a Number".

FP_INFINITE *x* is either positive infinity or negative infinity.

FP_ZERO *x* is zero.

FP_SUBNORMAL
x is too small to be represented in normalized format.

FP_NORMAL if nothing of the above is correct then it must be a normal floating-point number.

The other macros provide a short answer to some standard questions.

isfinite(*x***)** returns a nonzero value if
(fpclassify(x) != FP_NAN && fpclassify(x) != FP_INFINITE)

isnormal(*x***)** returns a nonzero value if (fpclassify(x) == FP_NORMAL)

isnan(*x***)** returns a nonzero value if (fpclassify(x) == FP_NAN)

isinf(*x***)** returns 1 if *x* is positive infinity, and −1 if *x* is negative infinity.

ATTRIBUTES

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

Interface	Attribute	Value
fpclassify(), **isfinite**(), **isnormal**(), **isnan**(), **isinf**()	Thread safety	MT-Safe

STANDARDS

POSIX.1-2001, POSIX.1-2008, C99.

For **isinf**(), the standards merely say that the return value is nonzero if and only if the argument has an infinite value.

NOTES

In glibc 2.01 and earlier, **isinf**() returns a nonzero value (actually: 1) if *x* is positive infinity or negative infinity. (This is all that C99 requires.)

SEE ALSO

finite(3), **INFINITY**(3), **isgreater**(3), **signbit**(3)