

**NAME**

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

**SYNOPSIS**

```
#include <math.h>
```

```
int fpclassify(x);
```

```
int isfinite(x);
```

```
int isnormal(x);
```

```
int isnan(x);
```

```
int isinf(x);
```

Link with *-lm*.

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

**fpclassify()**, **isfinite()**, **isnormal()**:

```
_XOPEN_SOURCE >= 600 || _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L;  
or cc -std=c99
```

**isnan()**:

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE || _ISOC99_SOURCE ||  
_POSIX_C_SOURCE >= 200112L;  
or cc -std=c99
```

**isinf()**:

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 600 || _ISOC99_SOURCE ||  
_POSIX_C_SOURCE >= 200112L;  
or cc -std=c99
```

**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**

**Multithreading** (see [pthreads\(7\)](#))

The **fpclassify()**, **isfinite()**, **isnormal()**, **isnan()**, and **isinf()** macros are thread-safe.

**CONFORMING TO**

C99, POSIX.1.

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\(3\)](#)

**COLOPHON**

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