### **NAME**

atan2, atan2f, atan2l - arc tangent function of two variables

### **SYNOPSIS**

```
#include <math.h>
double atan2(double y, double x);
float atan2f(float y, float x);
long double atan2l(long double y, long double x);
Link with -lm.
```

Feature Test Macro Requirements for glibc (see **feature test macros**(7)):

```
atan2f(), atan2l():
```

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L || /* Since glibc 2.19: */ _DEFAULT_SOURCE || _SVID_SOURCE || _SVID_SOURCE
```

### **DESCRIPTION**

These functions calculate the principal value of the arc tangent of y/x, using the signs of the two arguments to determine the quadrant of the result.

#### **RETURN VALUE**

On success, these functions return the principal value of the arc tangent of y/x in radians; the return value is in the range [-pi, pi].

If y is +0 (-0) and x is less than 0, +pi (-pi) is returned.

If y is +0 (-0) and x is greater than 0, +0 (-0) is returned.

If y is less than 0 and x is +0 or -0, -pi/2 is returned.

If y is greater than 0 and x is +0 or -0, pi/2 is returned.

If either x or y is NaN, a NaN is returned.

If y is +0 (-0) and x is -0, +pi (-pi) is returned.

If y is +0 (-0) and x is +0, +0 (-0) is returned.

If y is a finite value greater (less) than 0, and x is negative infinity, +pi (-pi) is returned.

If y is a finite value greater (less) than 0, and x is positive infinity, +0 (-0) is returned.

If y is positive infinity (negative infinity), and x is finite, pi/2 (-pi/2) is returned.

If y is positive infinity (negative infinity) and x is negative infinity, +3\*pi/4 (-3\*pi/4) is returned.

If y is positive infinity (negative infinity) and x is positive infinity, +pi/4 (-pi/4) is returned.

# **ERRORS**

No errors occur.

## **ATTRIBUTES**

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

| I | Interface                   | Attribute     | Value   |
|---|-----------------------------|---------------|---------|
| a | atan2(), atan2f(), atan2l() | Thread safety | MT-Safe |

### **CONFORMING TO**

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

The variant returning *double* also conforms to SVr4, 4.3BSD, C89.

### **SEE ALSO**

```
acos(3), asin(3), atan(3), carg(3), cos(3), sin(3), tan(3)
```

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# **COLOPHON**

This page is part of release 5.02 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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