

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
```

```
    /* Glibc versions <= 2.19: */ _BSD_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\(7\)](#).

Interface	Attribute	Value
<code>atan2()</code> , <code>atan2f()</code> , <code>atan2l()</code>	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\(3\)](#)

COLOPHON

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