

**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():
```

```
_BSD_SOURCE || _SVID_SOURCE || _XOPEN_SOURCE >= 600 || _ISOC99_SOURCE ||  
_POSIX_C_SOURCE >= 200112L;
```

```
or cc -std=c99
```

**DESCRIPTION**

The **atan2()** function calculates 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.

**CONFORMING TO**

C99, POSIX.1-2001. 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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