

**NAME**

`exp`, `expf`, `expl` – base-e exponential function

**SYNOPSIS**

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

```
double exp(double x);
```

```
float expf(float x);
```

```
long double expl(long double x);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see **feature\_test\_macros(7)**):

**expf()**, **expl()**:

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

**DESCRIPTION**

These functions return the value of *e* (the base of natural logarithms) raised to the power of *x*.

**RETURN VALUE**

On success, these functions return the exponential value of *x*.

If *x* is a NaN, a NaN is returned.

If *x* is positive infinity, positive infinity is returned.

If *x* is negative infinity, +0 is returned.

If the result underflows, a range error occurs, and zero is returned.

If the result overflows, a range error occurs, and the functions return **+HUGE\_VAL**, **+HUGE\_VALF**, or **+HUGE\_VALL**, respectively.

**ERRORS**

See **math\_error(7)** for information on how to determine whether an error has occurred when calling these functions.

The following errors can occur:

Range error, overflow

*errno* is set to **ERANGE**. An overflow floating-point exception (**FE\_OVERFLOW**) is raised.

Range error, underflow

*errno* is set to **ERANGE**. An underflow floating-point exception (**FE\_UNDERFLOW**) is raised.

**ATTRIBUTES**

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

Interface	Attribute	Value
<b>exp()</b> , <b>expf()</b> , <b>expl()</b>	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**

**cbrt(3)**, **cexp(3)**, **exp10(3)**, **exp2(3)**, **expm1(3)**, **sqrt(3)**

**COLOPHON**

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