

**NAME**

scalb, scalbf, scalbl – multiply floating-point number by integral power of radix (OBSOLETE)

**SYNOPSIS**

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

```
double scalb(double x, double exp);
```

```
float scalbf(float x, float exp);
```

```
long double scalbl(long double x, long double exp);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see `feature_test_macros(7)`):

**scalb():**

```
_XOPEN_SOURCE >= 500
```

```
    /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
    /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

**scalbf(), scalbl():**

```
_XOPEN_SOURCE >= 600
```

```
    /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
    /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

**DESCRIPTION**

These functions multiply their first argument *x* by **FLT\_RADIX** (probably 2) to the power of *exp*, that is:

$$x * \text{FLT\_RADIX} ** exp$$

The definition of **FLT\_RADIX** can be obtained by including `<float.h>`.

**RETURN VALUE**

On success, these functions return  $x * \text{FLT\_RADIX} ** exp$ .

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

If *x* is positive infinity (negative infinity), and *exp* is not negative infinity, positive infinity (negative infinity) is returned.

If *x* is +0 (−0), and *exp* is not positive infinity, +0 (−0) is returned.

If *x* is zero, and *exp* is positive infinity, a domain error occurs, and a NaN is returned.

If *x* is an infinity, and *exp* is negative infinity, a domain error occurs, and a NaN is returned.

If the result overflows, a range error occurs, and the functions return **HUGE\_VAL**, **HUGE\_VALF**, or **HUGE\_VALL**, respectively, with a sign the same as *x*.

If the result underflows, a range error occurs, and the functions return zero, with a sign the same as *x*.

**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:

Domain error: *x* is 0, and *exp* is positive infinity, or *x* is positive infinity and *exp* is negative infinity and the other argument is not a NaN

An invalid floating-point exception (**FE\_INVALID**) is raised.

Range error, overflow

An overflow floating-point exception (**FE\_OVERFLOW**) is raised.

Range error, underflow

An underflow floating-point exception (**FE\_UNDERFLOW**) is raised.

These functions do not set *errno*.

## ATTRIBUTES

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

Interface	Attribute	Value
<b>scalb()</b> , <b>scalbf()</b> , <b>scalbl()</b>	Thread safety	MT-Safe

## CONFORMING TO

**scalb()** is specified in POSIX.1-2001, but marked obsolescent. POSIX.1-2008 removes the specification of **scalb()**, recommending the use of **scalbln(3)**, **scalblnf(3)**, or **scalblnl(3)** instead. The **scalb()** function is from 4.3BSD.

**scalbf()** and **scalbl()** are unstandardized; **scalbf()** is nevertheless present on several other systems

## SEE ALSO

**ldexp(3)**, **scalbln(3)**

## 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/>.