

**NAME**

scalbn, scalbnf, scalbnl, scalbln, scalblnf, scalblnl – multiply floating-point number by integral power of radix

**SYNOPSIS**

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

```
double scalbn(double x, long int exp);
float scalbnf(float x, long int exp);
long double scalblnl(long double x, long int exp);

double scalbn(double x, int exp);
float scalbnf(float x, int exp);
long double scalbln(long double x, int exp);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see [feature\\_test\\_macros\(7\)](#)):

```
scalbn(), scalbnf(), scalblnl():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L || /* Since glibc 2.19: */ _DE-
    FAULT_SOURCE
scalbn(), scalbnf(), scalbln():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L || /* Since glibc 2.19: */ _DE-
    FAULT_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  $x$  is a NaN, a NaN is returned.

If  $x$  is positive infinity (negative infinity), positive infinity (negative infinity) is returned.

If  $x$  is +0 (−0), +0 (−0) 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:

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*.

**VERSIONS**

These functions first appeared in glibc in version 2.1.

**ATTRIBUTES**

For an explanation of the terms used in this section, see [attributes\(7\)](#).

Interface	Attribute	Value
<code>scalbn()</code> , <code>scalbnf()</code> , <code>scalbnl()</code> , <code>scalbln()</code> , <code>scalblnf()</code> , <code>scalblnl()</code>	Thread safety	MT-Safe

**CONFORMING TO**

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

**NOTES**

These functions differ from the obsolete functions described in [scalb\(3\)](#) in the type of their second argument. The functions described on this page have a second argument of an integral type, while those in [scalb\(3\)](#) have a second argument of type *double*.

If `FLT_RADIX` equals 2 (which is usual), then `scalbn()` is equivalent to [ldexp\(3\)](#).

**SEE ALSO**

[ldexp\(3\)](#), [scalb\(3\)](#)

**COLOPHON**

This page is part of release 4.16 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/>.