

**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 scalblnl(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: */ _DEFAULT_SOURCE
scalbn(), scalbnf(), scalbln():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    || /* 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:

$$x * FLT\_RADIX ** exp$$

The definition of `FLT_RADIX` can be obtained by including `<float.h>`.

**RETURN VALUE**

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

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
<b>scalbn()</b> , <b>scalbnf()</b> , <b>scalbnl()</b> , <b>scalbln()</b> , <b>scalblnf()</b> , <b>scalblnl()</b>	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**

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