

NAME

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

LIBRARY

Math library (*libm*, *-lm*)

SYNOPSIS

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

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

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

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

```
scalbn(), scalbnf(), scalbnl():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    || /* Since glibc 2.19: */ _DEFAULT_SOURCE

scalbn(), scalbnf(), scalbnl():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    || /* Since glibc 2.19: */ _DEFAULT_SOURCE
    || /* glibc <= 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

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

VERSIONS

These functions were added in glibc 2.1.

ATTRIBUTES

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

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

STANDARDS

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)**.

BUGS

Before glibc 2.20, these functions did not set *errno* for range errors.

SEE ALSO

ldexp(3), **scalb(3)**