



Rocky Enterprise Linux 9.2 Manual Pages on command 'frexp.3'

\$ man frexp.3

FREXP(3) Linux Programmer's Manual FREXP(3)

NAME

frexp, frexpf, frexpl - convert floating-point number to fractional and
integral components

SYNOPSIS

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

```
double frexp(double x, int *exp);
```

```
float frexpf(float x, int *exp);
```

```
long double frexpl(long double x, int *exp);
```

Link with -lm.

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

frexpf(), frexpl():

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
```

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

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

DESCRIPTION

These functions are used to split the number x into a normalized frac-
tion and an exponent which is stored in exp.

RETURN VALUE

These functions return the normalized fraction. If the argument x is not zero, the normalized fraction is x times a power of two, and its absolute value is always in the range $1/2$ (inclusive) to 1 (exclusive), that is, $[0.5, 1)$.

If x is zero, then the normalized fraction is zero and zero is stored in `exp`.

If x is a NaN, a NaN is returned, and the value of `*exp` is unspecified.

If x is positive infinity (negative infinity), positive infinity (negative infinity) is returned, and the value of `*exp` is unspecified.

ERRORS

No errors occur.

ATTRIBUTES

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

??

?Interface ? Attribute ? Value ?

??

?frexp(), frexpf(), frexpl() ? Thread safety ? MT-Safe ?

??

CONFORMING TO

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

The variant returning double also conforms to SVr4, 4.3BSD, C89.

EXAMPLES

The program below produces results such as the following:

```
$ ./a.out 2560
```

```
frexp(2560, &e) = 0.625: 0.625 * 2^12 = 2560
```

```
$ ./a.out -4
```

```
frexp(-4, &e) = -0.5: -0.5 * 2^3 = -4
```

Program source

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

```
#include <float.h>
```

```
#include <stdio.h>
```

```

#include <stdlib.h>

int
main(int argc, char *argv[])
{
    double x, r;
    int exp;
    x = strtod(argv[1], NULL);
    r = frexp(x, &exp);
    printf("frexp(%g, &e) = %g: %g * %d^%d = %g\n",
        x, r, r, FLT_RADIX, exp, x);
    exit(EXIT_SUCCESS);
}

```

SEE ALSO

ldexp(3), modf(3)

COLOPHON

This page is part of release 5.10 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/>.

2020-06-09

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