Full credit is given to the above companies including the OS that this PDF file was generated!

Red Hat Enterprise Linux Release 9.2 Manual Pages on 'exp.3p' command

$ man exp.3p

EXP(3P) POSIX Programmer's Manual EXP(3P)

PROLOG

This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

NAME

exp, expf, expl ? exponential function

SYNOPSIS

```
#include <math.h>
double exp(double x);
float expf(float x);
long double expl(long double x);
```

DESCRIPTION

The functionality described on this reference page is aligned with the ISO C standard. Any conflict between the requirements described here and the ISO C standard is unintentional. This volume of POSIX.1?2017 defers to the ISO C standard.

These functions shall compute the base-e exponential of x.

An application wishing to check for error situations should set errno to zero and call feclearexcept(FE_ALL_EXCEPT) before calling these functions. On return, if errno is non-zero or fetestexcept(FE_INVALID | FE_DIVBYZERO | FE_OVERFLOW | FE_UNDERFLOW) is non-zero, an error has

occurred.

RETURN VALUE

Upon successful completion, these functions shall return the exponen? tial value of x.

If the correct value would cause overflow, a range error shall occur and exp(), expf(), and expl() shall return the value of the macro HUGE_VAL, HUGE_VALF, and HUGE_VALL, respectively.

If the correct value would cause underflow, and is not representable, a range error may occur, and exp(), expf(), and expl() shall return 0.0, or (if the IEC 60559 Floating-Point option is not supported) an imple? mentation-defined value no greater in magnitude than DBL_MIN, FLT_MIN, and LDBL_MIN, respectively.

If x is NaN, a NaN shall be returned.

If x is ?0, 1 shall be returned.

If x is -Inf, +0 shall be returned.

If x is +Inf, x shall be returned.

If the correct value would cause underflow, and is representable, a range error may occur and the correct value shall be returned.

ERRORS

These functions shall fail if:

Range Error The result overflows.

If the integer expression (math_errhandling & MATH_ERRNO) is non-zero, then errno shall be set to [ERANGE]. If the integer expression (math_errhandling & MATH_ERREXCEPT) is non-zero, then the overflow floating-point exception shall be raised.

These functions may fail if:

Range Error The result underflows.

If the integer expression (math_errhandling & MATH_ERRNO) is non-zero, then errno shall be set to [ERANGE]. If the integer expression (math_errhandling & MATH_ERREXCEPT) is non-zero, then the underflow floating-point exception shall be raised.

The following sections are informative.

EXAMPLES

Computing the Density of the Standard Normal Distribution

This function shows an implementation for the density of the standard normal distribution using exp(). This example uses the constant M_PI which is part of the XSI option.

```
#include <math.h>
double
normal_density (double x)
{
    return exp(-x*x/2) / sqrt (2*M_PI);
}
```

APPLICATION USAGE

On error, the expressions (math_errhandling & MATH_ERRNO) and (math_er?rhandling & MATH_ERREXCEPT) are independent of each other, but at least one of them must be non-zero.

RATIONALE

None.

FUTURE DIRECTIONS

None.

SEE ALSO

feclearexcept(), fetestexcept(), isnan(), log()

The Base Definitions volume of POSIX.1?2017, Section 4.20, Treatment of Error Conditions for Mathematical Functions, <math.h>

COPYRIGHT

Portions of this text are reprinted and reproduced in electronic form from IEEE Std 1003.1-2017, Standard for Information Technology -- Por?table Operating System Interface (POSIX), The Open Group Base Specifi?cations Issue 7, 2018 Edition, Copyright (C) 2018 by the Institute of Electrical and Electronics Engineers, Inc and The Open Group. In the event of any discrepancy between this version and the original IEEE and The Open Group Standard, the original IEEE and The Open Group Standard is the referee document. The original Standard can be obtained online

at http://www.opengroup.org/unix/online.html .

Any typographical or formatting errors that appear in this page are most likely to have been introduced during the conversion of the source files to man page format. To report such errors, see https://www.ker?nel.org/doc/man-pages/reporting_bugs.html .