



Linux Ubuntu 26.04 Manual Pages on command 'tgamma.3'

\$ man tgamma.3

tgamma(3) Library Functions Manual tgamma(3)

NAME

tgamma, tgammaf, tgammal - true gamma function

LIBRARY

Math library (libm, -lm)

SYNOPSIS

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

```
double tgamma(double x);
```

```
float tgammaf(float x);
```

```
long double tgammal(long double x);
```

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

```
tgamma(), tgammaf(), tgammal():
```

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

DESCRIPTION

These functions calculate the Gamma function of x.

The Gamma function is defined by

$$\Gamma(x) = \int_0^{\infty} t^{x-1} e^{-t} dt$$

It is defined for every real number except for nonpositive integers. For nonnegative integers?

For m one has

$$\Gamma(m+1) = m!$$

and, more generally, for all x:

$$\Gamma(x+1) = x * \Gamma(x)$$

Furthermore, the following is valid for all values of x outside the poles:

[illegible][illegible]

C11, POSIX.1-2008.

glibc 2.1. C99, POSIX.1-2001.

This function had to be called "true gamma function" since there is already a function `gamma(3)` that returns something else (see `gamma(3)` for details).

Before glibc 2.18, the glibc implementation of these functions did not set `errno` to `EDOM` when `x` is negative infinity.

Before glibc 2.19, the glibc implementation of these functions did not set `errno` to `ERANGE` on an underflow range error.

In glibc versions 2.3.3 and earlier, an argument of +0 or -0 incorrectly produced a domain error (errno set to EDOM and an FE_INVALID exception raised), rather than a pole error.

gamma(3), lgamma(3)

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