NAME

qgamma – Quadruple-precision Gamma(x)

SYNOPSIS

Fortran (77, 90, 95, HPF):

f77 *[flags] file(s) . . . -L/usr/local/lib -lgjl*

REAL*16 FUNCTION qgamma(x)
REAL*16   x

C (K&R, 89, 99), C++ (98):

cc *[flags] -I/usr/local/include file(s) . . . -L/usr/local/lib -lgjl*

Use

#include <gampsi.h>

to get this prototype:

**fortran_quadruple_precision   qgamma(const   fortran_quadruple_precision   *
x_);**

NB: The definition of C/C++ data types **fortran_** *xxx*, and the mapping of Fortran external names to C/C++ external names, is handled by the C/C++ header file. That way, the same function or subroutine name can be used in C, C++, and Fortran code, independent of compiler conventions for mangling of external names in these programming languages.

Last code modification: 04-Aug-2000

DESCRIPTION

Compute and return the value of the Gamma(**x**) function for quadruple-precision **x**.

This code correctly handles the case where **x** is NaN, for which Gamma(NaN) is a NaN. and the case where **x** is sufficiently large and positive, or takes one of the integer values 0, -1, -2, -3, . . ., for which Gamma(**x**) = +Infinity, a special value in IEEE 754 arithmetic.

This code is derived from code given by

W. J. Cody
Algorithm 715: SPECFUN --- A Portable FORTRAN
Package of Special Function Routines and Test Drivers
ACM Trans. Math. Software 19(1) 22--32, March 1993.

but has been augmented for support of IEEE 754 arithmetic, and extended with a new rational Pade approximation for **x***Gamma(**x**) in [1,2], and new algorithms for argument reduction.

SEE ALSO

dgamma(3), **dpsi**(3), **dpsiln**(3), **gamma**(3), **psi**(3), **psiln**(3), **qpsi**(3), **qpsiln**(3).

AUTHORS

The algorithms and code are described in detail in the paper
Algorithm xxx: Quadruple-Precision Gamma(x) and psi(x) Functions for Real Arguments
in ACM Transactions on Mathematical Software, Volume ??, Number ??, Pages ????--???? and ????--????,
2001, by

Nelson H. F. Beebe
Center for Scientific Computing
University of Utah
Department of Mathematics, 110 LCB
155 S 1400 E RM 233
Salt Lake City, UT 84112-0090
Tel: +1 801 581 5254
FAX: +1 801 581 4148
Email: beebe@math.utah.edu, beebe@acm.org, beebe@computer.org
WWW URL: http://www.math.utah.edu/~beebe

and

James S. Ball

University of Utah
Department of Physics
Salt Lake City, UT 84112-0830
USA
Tel: +1 801 581 8397
FAX: +1 801 581 6256
Email: `ball@physics.utah.edu`
WWW URL: `http://www.physics.utah.edu/people/faculty/ball.html`