GAMMAIC

PURPOSE

Compute the complementary incomplete gamma function.

DESCRIPTION

The complementary incomplete gamma function is defined as:

$$Q(x, a) = \int_x^\infty e^{-t} t^{a-1} dt \qquad (x \geq 0) \qquad \textbf{(EQ 6-89)}$$

where a is a shape parameter. If x is zero, then a must be positive. Otherwise, a can be any real value. Also, there can be a loss of precision if a is too near a negative integer.

SYNTAX

LET <y2> = GAMMAIC(<y1>,<a>)   <SUBSET/EXCEPT/FOR qualification>

where <y1> is a non-negative number, variable or parameter;

   <a> is a number, parameter, or variable;

   <y2> is a variable or a parameter (depending on what <y1> and <a> are) where the computed incomplete gamma values are stored;

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = GAMMAIC(2.3,1)
LET A = GAMMAIC(X,A1)
LET X2 = GAMMAIC(X1,4.2)

NOTE

DATAPLOT uses the routine DGAMIC from the SLATEC Common Mathematical Library to compute this function. SLATEC is a large set of high quality, portable, public domain Fortran routines for various mathematical capabilities maintained by seven federal laboratories.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

GAMMA	=	Compute the gamma function.
LOGGAMMA	=	Compute the log (to base e) gamma function.
GAMMAIP	=	Compute an alternate form of the incomplete gamma function.
GAMMAI	=	Compute the incomplete Gamma function.
GAMMAR	=	Compute the reciprocal gamma function.
TRICOMI	=	Compute Tricomi's incomplete gamma function.
DIGAMMA	=	Compute the digamma function.

REFERENCE

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegun, National Bureau of Standards, 1964 (chapter 6).

"Numerical Recipes: The Art of Scientific Computing (FORTRAN Version)," 2nd Edition, Press, Flannery, Teukolsky, and Vetterling, Cambridge University Press, 1992 (chapter 6).

APPLICATIONS

Special Functions

IMPLEMENTATION DATE
        94/9

PROGRAM
        TITLE COMPLEMENTARY INCOMPLETE GAMMA FUNCTIONS
        LINE DOT SOLID DASH DASH
        PLOT GAMMAIC(X,0.5) FOR X = 0.01 0.01 10 AND
        PLOT GAMMAIC(X,1) FOR X = 0.01 0.01 10 AND
        PLOT GAMMAIC(X,3) FOR X = 0.01 0.01 10 AND
        PLOT GAMMAIC(X,4) FOR X = 0.01 0.01 10

COMPLEMENTARY INCOMPLETE GAMMA FUNCTIONS