

LOGGAMMA**PURPOSE**

Compute the natural logarithm of a gamma function.

DESCRIPTION

The gamma function is defined as:

$$\Gamma(a) = \int_0^{\infty} x^{a-1} e^{-x} dx \quad (\text{EQ 6-99})$$

where the integral is taken from 0 to infinity and a is a positive real number. The loggamma function takes the natural logarithm of this number.

The loggamma function is typically used for numerical stability (the regular gamma function tends to overflow for even moderate values of x and a).

SYNTAX

LET <y2> = LOGGAMMA(<y1>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a variable or a parameter containing positive values;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed loggamma values are stored; and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = LOGGAMMA(14)

LET X2 = LOGGAMMA(X1)

LET X2 = LOGGAMMA(X1-4)

NOTE 1

For integer values of a, the gamma function reduces to a factorial. Specifically,

$$\Gamma(a)=(a-1)!$$

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LOG	=	Compute the natural logarithm of a number.
GAMMA	=	Compute the gamma function of a number.
GAMMAI	=	Compute the incomplete gamma function.
GAMMAIP	=	Compute the incomplete gamma function ratio.
GAMMAIC	=	Compute the complementary incomplete Gamma function.
GAMMAR	=	Compute the reciprocal gamma function.
TRICOMI	=	Compute Tricomi's incomplete gamma function.

APPLICATIONS

Special functions

IMPLEMENTATION DATE

Pre-1987

PROGRAM

TITLE AUTOMATIC

PLOT LOGGAMMA(X) FOR X = 0.01 0.01 9.9

