

LGAPPF**PURPOSE**

Compute the standard form of the log-gamma percent point function with shape parameter g .

DESCRIPTION

The standard form of the log-gamma distribution has the following probability density function:

$$f(x, \gamma) = \frac{e^{\gamma x - e^x}}{\Gamma(\gamma)} \quad \gamma > 0 \quad \text{(EQ Aux-232)}$$

where γ is the shape parameter and Γ is the gamma function (see the documentation for the GAMMA command for details of this function).

The percent point function is calculated numerically using a bisection method.

SYNTAX

LET <y> = LGAPPF(<p>,<gamma>) <SUBSET/EXCEPT/FOR qualification>

where <p> is a positive number, parameter, or variable in the range 0 to 1;

<y> is a variable or a parameter (depending on what <p> is) where the computed log-gamma ppf value is saved;

<gamma> is a number or parameter that specifies the shape parameter;

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

EXAMPLES

LET A = LGAPPF(0.95,1.5)

LET X2 = LGAPPF(X1,GAMMA)

NOTE 1

The general form of the log-gamma probability density function is:

$$f(x, \gamma, \mu, \sigma) = \frac{e^{\gamma \frac{x-\mu}{\sigma} - e^{\frac{x-\mu}{\sigma}}}}{\Gamma(\gamma)} \quad \gamma > 0, \sigma > 0 \quad \text{(EQ Aux-233)}$$

where μ is a location parameter and σ is a scale parameter.

NOTE 2

Prentice has given a reparameterized log-gamma probability density function that many analysts prefer. The pdf for this is given on page 90 of the Johnson, Kotz, and Balakrishnan book (see the Reference section below). DATAPLOT does not directly support the reparameterized form at this time.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LGACDF	=	Compute the log-gamma cumulative distribution function.
LGAPDF	=	Compute the log-gamma probability density function.
GAMCDF	=	Compute the gamma cumulative distribution function.
GAMPDF	=	Compute the gamma probability density function.
GAMPPF	=	Compute the gamma percent point function.
EV1CDF	=	Compute the extreme value type 1 cumulative distribution function.
EV1PDF	=	Compute the extreme value type 1 probability density function.
EV1PPF	=	Compute the extreme value type 1 percent point function.
EV2CDF	=	Compute the extreme value type 2 cumulative distribution function.
EV2PDF	=	Compute the extreme value type 2 probability density function.
EV2PPF	=	Compute the extreme value type 2 percent point function.

REFERENCE

“Continuous Univariate Distributions - Vol. 2,” 2nd. Ed., Johnson, Kotz, and Balakrishnan, John Wiley and Sons, 1994 (pp. 89-90).

APPLICATIONS

Extreme Value Analysis, Lifetime Analysis

IMPLEMENTATION DATE

95/10

PROGRAM

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MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 100
Y1LABEL X
X1LABEL PROBABILITY
.
LET GAMMA = 0.1
TITLE LOG-GAMMA PPF - GAMMA = ^GAMMA
PLOT LGAPPF(P,GAMMA) FOR P = 0.01 0.01 0.99
LET GAMMA = 0.5
TITLE LOG-GAMMA PPF - GAMMA = ^GAMMA
PLOT LGAPPF(P,GAMMA) FOR P = 0.01 0.01 0.99
LET GAMMA = 1.0
TITLE LOG-GAMMA PPF - GAMMA = ^GAMMA
PLOT LGAPPF(P,GAMMA) FOR P = 0.01 0.01 0.99
LET GAMMA = 2.0
TITLE LOG-GAMMA PPF - GAMMA = ^GAMMA
PLOT LGAPPF(P,GAMMA) FOR P = 0.01 0.01 0.99
END OF MULTIPLY
    
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