

LLGCDF**PURPOSE**

Compute the log-logistic probability density function.

DESCRIPTION

The log-logistic distribution has the following cumulative distribution function:

$$f(x, \delta) = \frac{\delta x^{\delta-1}}{(1+x^\delta)^2} \quad x > 0, \delta > 0 \quad \text{(EQ Aux-234)}$$

The cumulative distribution is the area under the curve from 0 to x (i.e., the integral of the above function). It has the formula:

$$F(x, \delta) = \frac{1}{1+x^{-\delta}} \quad x > 0, \delta > 0 \quad \text{(EQ Aux-235)}$$

SYNTAX

LET <y2> = LLGCDF(<y1>,<d>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a positive number, parameter or variable;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed log-logistic cdf value is stored;

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

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

EXAMPLES

LET A = LLGCDF(3,2)

LET X2 = LLGCDF(X1,D)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LLGPDF	=	Compute the log-logistic probability density function.
LLGPPF	=	Compute the log-logistic percent point function.
LOGCDF	=	Compute the logistic cumulative distribution function.
LOGPDF	=	Compute the logistic probability density function.
LOGPPF	=	Compute the logistic percent point function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
LGNCDF	=	Compute the lognormal cumulative distribution function.
LGNPDF	=	Compute the lognormal probability density function.
LGNPPF	=	Compute the lognormal percent point function.

REFERENCE

"Measuring Skewness With Respect To The Mode," Arnold and Groeneveld, The American Statistician, February 1995 (page 36).

APPLICATIONS

Lifetime Analysis

IMPLEMENTATION DATE

95/5

PROGRAM

```
LET D = DATA 0.1 0.5 1.0 1.5 2.0 2.5 5 10 20
.
MULTIPLY 3 3; MULTIPLY CORNER COORDINATES 0 0 100 100
TITLE AUTOMATIC
LOOP FOR K = 1 1 9
  LET D1 = D(K)
  X1LABEL DELTA = ^D1
  PLOT LLGCDF(X,D1) FOR X = 0.01 0.01 5
END OF LOOP
END OF MULTIPLY
```

