

GLOCDF**PURPOSE**

Compute the standard form of the type I generalized logistic cumulative distribution function with shape parameter α .

DESCRIPTION

For positive α , the standard form of the generalized logistic probability density function is:

$$f(x, \alpha) = \frac{\alpha}{(e^x(1 + e^{-x}))^{\alpha+1}} \quad (\text{EQ Aux-175})$$

where α is a positive shape parameter. The cumulative distribution function has the formula:

$$F(x, \alpha) = \frac{1}{(1 + e^{-x})^\alpha} \quad (\text{EQ Aux-176})$$

SYNTAX

LET <y> = GLOCDF(<x>,<alpha>) <SUBSET/EXCEPT/FOR qualification>

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

<y> is a variable or a parameter (depending on what <x> is) where the computed generalized logistic cdf value is saved;

<alpha> is a variable, number or parameter that specifies the shape parameter;

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

EXAMPLES

LET A = GLOCDF(3,1.5)

LET X2 = GLOCDF(X1,ALPHA)

NOTE 1

The general form of the generalized logistic cumulative distribution function is:

$$F(x, \alpha, \mu, \sigma) = \frac{1}{\left(1 + e^{\frac{-(x-\mu)}{\sigma}}\right)^\alpha} \quad (\text{EQ Aux-177})$$

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

NOTE 2

Johnson, Kotz, and Balakrishnan also define type II, type III and type IV generalized logistic distributions. These are currently not supported by DATAPLOT.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

GLOPDF	=	Compute the generalized logistic probability density function.
GLOPPF	=	Compute the generalized 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.
LLGCDF	=	Compute the log-logistic cumulative distribution function.
LLGPDF	=	Compute the log-logistic probability density function.
LLGPPF	=	Compute the log-logistic percent point function.

REFERENCE

"Continuous Univariate Distributions - Volume 2", 2nd. Ed., Johnson, Kotz, and Balakrishnan, Wiley and Sons, 1994 (pp. 140-147).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

95/12

PROGRAM

```
TITLE GLOCDF FOR X = -10 0.01 10
XILABEL X
YILABEL PROBABILITY
LET G = DATA 1 2 5 0.5
LEGEND 1 COORDINATES 25 87
MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 98
LOOP FOR K = 1 1 4
  LET GAMMA = G(K)
  LEGEND 1 GAMMA = ^GAMMA
  PLOT GLOCDF(X,GAMMA) FOR X = -10 0.01 10
END OF LOOP
END OF MULTIPLY
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