

LOGCDF**PURPOSE**

Compute the standard logistic (i.e, mean=0, sd= $\pi/\sqrt{3}$) cumulative distribution function.

DESCRIPTION

The standard form of the logistic probability density function is:

$$f(x) = \frac{e^{-x}}{(1 + e^{-x})^2} \quad (\text{EQ 8-260})$$

The standard form of the logistic cumulative distribution function is:

$$F(x) = \frac{1}{(1 + e^{-x})} \quad (\text{EQ 8-261})$$

SYNTAX

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

where <y1> is a variable or a parameter;

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

EXAMPLES

LET A = LOGCDF(3)

LET Y = LOGCDF(X1)

NOTE

The general form of the logistic cumulative distribution function is:

$$F(x) = \frac{1}{\left(1 + e^{\frac{-(x-\mu)}{\sigma}}\right)} \quad (\text{EQ 8-262})$$

where μ is a location parameter and σ is a scale parameter. See topic (3) under the General considerations section at the beginning of this chapter for a discussion of generating cdf values for the general form of the distribution.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LOGPDF	=	Compute the logistic probability density function.
LOGPPF	=	Compute the logistic percent point function.
LOGSF	=	Compute the logistic sparsity function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
EXPCDF	=	Compute the exponential cumulative distribution function.
EXPPDF	=	Compute the exponential probability density function.
EXPPPF	=	Compute the exponential percent point function.

REFERENCE

"Continuous Univariate Distributions - 2," Johnson and Kotz, Houghton-Mifflin, 1970 (chapter 22).

"Statistical Distributions," 2nd ed., Evans, Hastings, and Peacock, Wiley and Sons, 1993 (chapter 24).

“Statistical Models and Methods for Lifetime Data,” Lawless, John Wiley, 1982 (pp. 46-47).

APPLICATIONS

Reliability

IMPLEMENTATION DATE

94/4

PROGRAM

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YLIMITS 0 1
MAJOR YTIC NUMBER 6
MINOR YTIC NUMBER 1
YTIC DECIMAL 1
XLIMITS -7 7
XTIC OFFSET 0.6 0.6
TITLE AUTOMATIC
PLOT LOGCDF(X) FOR X = -7.5 0.01 7.5
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