LOGSF

PURPOSE

Compute the standard logistic sparsity function.

DESCRIPTION

The standard form of the logistic probability density function is:

$$f(x) = \frac{e^{-x}}{(1 + e^{-x})^2} \qquad \textbf{(EQ 8-268)}$$

The standard form of the logistic sparsity function is:

$$sf(p) = \frac{1}{p - p^2} \qquad \textbf{(EQ 8-269)}$$

The input value is a real number between 0 and 1.

SYNTAX

LET <y2> = LOGSF(<y1>)   <SUBSET/EXCEPT/FOR qualification>
where <y1> is a variable or a parameter in the range 0 to 1;
        <y2> is a variable or a parameter (depending on what <y1> is) where the computed logistic sf value is stored;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = LOGSF(0.9)
LET Y = LOGSF(P)

NOTE

The general form of the logistic sparsity function is:

$$sf(p) = \frac{\sigma}{p - p^2} \qquad \textbf{(EQ 8-270)}$$

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 sparsity function values for the general form of the distribution.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

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.
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
XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
TITLE AUTOMATIC
PLOT LOGSF(X) FOR X = 0.01 .01 0.99