DEXSF

PURPOSE

Compute the standard form of the double exponential (also known as the Laplace) sparsity function.

DESCRIPTION

The standard form of the double exponential probability density function is:

$$f(x) = \frac{e^{-|x|}}{2} \qquad \textbf{(EQ 8-158)}$$

The standard form of the double exponential sparsity function is:

$$sf(p) = \frac{1}{p} \qquad \text{for } p \leq 0.5 \qquad \textbf{(EQ 8-159)}$$

$$sf(p) = \frac{1}{1-p} \qquad \text{for } p > 0.5 \qquad \textbf{(EQ 8-160)}$$

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

SYNTAX

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

where <y1> is a variable, a number, or a parameter in the range 0 to 1;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed double exponential sf value is stored;

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

EXAMPLES

LET A = DEXSF(0.9)

LET Y = DEXSF(P)

NOTE

The general form of the double exponential probability density function is:

$$f(x) = \frac{e^{\frac{-|x-\mu|}{\beta}}}{2\beta} \qquad \textbf{(EQ 8-161)}$$

The parameter μ is a location parameter and the parameter β is a scale parameter. The general form of the double exponential sparsity function is:

$$sf(p) = \frac{\beta}{p} \qquad \text{for } p \leq 0.5 \qquad \textbf{(EQ 8-162)}$$

$$sf(p) = \frac{\beta}{1-p} \qquad \text{for } p > 0.5 \qquad \textbf{(EQ 8-163)}$$

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

DEXCDF	=	Compute the double exponential cumulative distribution function.
DEXPDF	=	Compute the double exponential probability density function.
DEXPPF	=	Compute the double exponential percent point function.

EXPCDF	=	Compute the exponential cumulative distribution function.
EXPPDF	=	Compute the exponential probability density function.
EXPPPF	=	Compute the exponential percent point function.
WEICDF	=	Compute the Weibull cumulative distribution function.
WEIPDF	=	Compute the Weibull probability density function.
WEIPPF	=	Compute the Weibull percent point function.
EV1CDF	=	Compute the extreme value type I cumulative distribution function.
EV1PDF	=	Compute the extreme value type I probability density function.
EV1PPF	=	Compute the extreme value type I percent point function.

REFERENCE

"Continuous Univariate Distributions," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 23).

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegum, National Bureau of Standards, 1964 (page 930).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

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XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
TITLE AUTOMATIC
Y1LABEL PROBABILITY
PLOT DEXSF(X) FOR X = 0.01 .01 0.99
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