LAMSF

PURPOSE

Compute the Tukey-Lambda sparsity function.

DESCRIPTION

The Tukey-Lambda distribution does not have a simple closed formula for the probability density function or the cumulative distribution function. TheTukey-Lambda sparsity function is:

$$sf(p) = p^{(\lambda-1)} + (1-p)^{(\lambda-1)} \quad \textbf{(EQ 8-252)}$$

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

SYNTAX

LET <y2> = LAMSF(<y1>,lambda) <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 Tukey-Lambda sf value is stored;

<lambda> is a number or parameter that specifies the shape parameter;

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

EXAMPLES

LET A = LAMSF(0.9,0.3)

LET Y = LAMSF(P,0.5)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LAMCDF	=	Compute the Tukey-Lambda cumulative distribution function.
LAMPDF	=	Compute the Tukey-Lambda probability density function.
LAMPPF	=	Compute the Tukey-Lambda percent point function.
NORPDF	=	Compute the standard normal probability density function.
NORCDF	=	Compute the standard normal cumulative distribution function.
NORPPF	=	Compute the standard normal percent point function.
LOGCDF	=	Compute the logistic cumulative distribution function.
LOGPDF	=	Compute the logistic probability density function.
LOGPPF	=	Compute the logistic percent point function.
UNICDF	=	Compute the uniform cumulative distribution function.
UNIPDF	=	Compute the uniform probability density function.
UNIPPF	=	Compute the uniform percent point function.

REFERENCE

"Low Moments for Small Samples: A Comparative Study of Order Statistics," Hastings, Mosteller, Tukey, and Winsor, Annals of Mathematical Statistics, 18, 1947 (pp. 413-426).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

```
XLIMITS 0 1
XTIC OFFSET 0.1 0.1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
MULTIPLOT 2 3; MULTIPLOT CORNER COORDINATES 0 0 100 100
LET JUNK = -1
TITLE AUTOMATIC; TITLE SIZE 3
X1LABEL EXACTLY UNIFORM DISTRIBUTION
PLOT LAMPPF(X,1) FOR X = 0.01 .01 0.99
X1LABEL U SHAPED
PLOT LAMPPF(X,0.5) FOR X = 0.01 0.01 0.99
X1LABEL APPROXIMATELY NORMAL
PLOT LAMPPF(X,0.14) FOR X = 0.01 0.01 0.99
X1LABEL EXACTLY LOGISTIC
PLOT LAMPPF(X,0) FOR X = 0.01 0.01 0.99
X1LABEL APPROXIMATELY CAUCHY
PLOT LAMPPF(X,JUNK) FOR X = 0.01 0.01 0.99
X1LABEL
PLOT LAMPPF(X,5) FOR X = 0.01 0.01 0.99
END OF MULTIPLOT
```