

KAPPPF**PURPOSE**

Compute Mielke's beta-kappa percent point function.

DESCRIPTION

Mielke's beta-kappa distribution has the following probability density function:

$$f(x) = (k/\beta)^k (x/\beta)^{k-1} / (1 + (k/\beta)^\theta)^{1+k/\theta} \quad x > 0$$

$$f(x, \kappa, \beta, \theta) = \frac{\kappa \left(\frac{x}{\beta}\right)^{\kappa-1}}{\left(1 + \left(\frac{x}{\beta}\right)^\theta\right)^{1+\frac{\kappa}{\theta}}} \quad x > 0 \quad \text{(EQ Aux-214)}$$

where κ , β , and θ are shape parameters. The percent point function has the formula:

$$G(p, \kappa, \beta, \theta) = \beta \left(\frac{-p^{\theta/\kappa}}{p^{\theta/\kappa} - 1} \right)^{1/\theta} \quad \text{(EQ Aux-215)}$$

Mielke's beta-kappa distribution is a special case of a reparameterized generalized F distribution of the form $a*(F(v1,v2)**b)$. The details of the reparameterization are given in the Johnson, Kotz, and Balakrishnan book (see the Reference sections below). This reference also discusses several forms of generalized F distributions.

SYNTAX

LET <y> = KAPPPF(<p>,<k>,<beta>,<theta>) <SUBSET/EXCEPT/FOR qualification>

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

<y> is a variable or a parameter (depending on what <p> is) where the computed Mielke's beta-kappa ppf value is saved;

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

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

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

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

EXAMPLES

LET A = KAPPPF(0.95,0.5,2,1.5)

LET X2 = KAPPPF(X1,K,BETA,THETA)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

KAPCDF	=	Compute the Mielke's beta-kappa cumulative distribution function.
KAPPDF	=	Compute the Mielke's beta-kappa cumulative distribution function.
BETCDF	=	Compute the beta cumulative distribution function.
BETPDF	=	Compute the beta probability density function.
BETPPF	=	Compute the beta percent point function.
FCDF	=	Compute the F cumulative distribution function.
FPDF	=	Compute the F probability density function.
FPPF	=	Compute the F percent point function.

REFERENCE

"Continuous Univariate Distributions - Vol. 2," 2nd. Ed., Johnson, Kotz, and Balakrishnan, John Wiley and Sons, 1994 (pp. 348-351).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

96/1

PROGRAM

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LET KP = DATA 1 1 1 0.5 0.5 0.5 2 2 2
LET BP = DATA 0.5 1 2 0.5 1 2 0.5 1 2
LET TP = DATA 0.5 1 2 0.5 1 2 0.5 1 2
.
TITLE AUTOMATIC
TIC LABEL SIZE 3
LABEL SIZE 3
.
MULTIPLY 3 3; MULTIPLY CORNER COORDINATES 0 0 100 100
LOOP FOR LL = 1 1 9
  LET K = KP(LL)
  LET B = BP(LL)
  LET T = TP(LL)
  X1LABEL K = ^K, BETA = ^B, THETA = ^T
  PLOT KAPPPF(P,K,B,T) FOR P = 0.01 0.01 0.99
END OF LOOP
END OF MULTIPLY

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