KAPPDF

PURPOSE
Compute Mielke's beta-kappa probability density function.

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

$$f(x, \kappa, \beta, \theta) = \frac{\kappa}{\beta} \frac{\left(\frac{x}{\beta}\right)^{\kappa - 1}}{\left(1 + \left(\frac{x}{\beta}\right)^{\theta}\right)^{1 + \frac{\kappa}{\theta}}} \qquad x > 0 \qquad \textbf{(EQ Aux-213)}$$

where κ, β, and θ are shape parameters.

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> = KAPPDF(<x>,<k>,<beta>,<theta>)   <SUBSET/EXCEPT/FOR qualification>
where <x> is a positive number, parameter, or variable;
    <y> is a variable or a parameter (depending on what <x> is) where the computed Mielke's beta-kappa pdf 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 = KAPPDF(3,0.5,2,1.5)
LET X2 = KAPPDF(X1,K,BETA,THETA)

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS
KAPCDF	=	Compute the Mielke's beta-kappa probability density function.
KAPPPF	=	Compute the Mielke's beta-kappa percent point 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

        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
        .
        MULTIPLOT 3 3; MULTIPLOT 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 KAPPDF(X,K,B,T) FOR X = 0.01 0.01 5
        END OF LOOP
        END OF MULTIPLOT