FPPF

PURPOSE

Compute the F percent point function with degrees of freedom parameters ν_1 and ν_2.

DESCRIPTION

The F distribution is the ratio of 2 chi-square distributions with ν_1 and ν_2 degrees of freedom respectively. This yields the following probability density function:

$$f(x) = \frac{\Gamma\left(\frac{\nu_1 + \nu_2}{2}\right)\left(\frac{\nu_1}{\nu_2}\right)^{\frac{\nu_1}{2}} x^{\frac{\nu_1}{2} - 1}}{\Gamma\left(\frac{\nu_1}{2}\right)\Gamma\left(\frac{\nu_2}{2}\right)\left(1 + \frac{\nu_1 x}{\nu_2}\right)^{\frac{\nu_1 + \nu_2}{2}}} \qquad \text{(EQ 8-210)}$$

The percent point function for the F distribution does not have a simple general closed form. This function is restricted to integer degrees of freedom. However, there are functions for the non-central F (NCFCDF) and the doubly non-central F (DNFCDF). These functions can be used for the central F case with non-integer degrees of freedom by setting the non-centrality parameters to zero.

SYNTAX

LET <y2> = FPDF(<y1>,<nu1>,<nu2>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a variable or a parameter containing positive values;

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

<nu1> and <nu2> are positive integer numbers or parameters that define the degrees of freedom;

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

EXAMPLES

LET A = FPPF(0.9,10,8)
LET Y = FPPF(X1,10,8)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

FCDF	=	Compute the F cumulative distribution function.
FPDF	=	Compute the F probability density function.
NCFCDF	=	Compute the non-central F cumulative distribution function.
DNFCDF	=	Compute the doubly non-central F cumulative distribution function.
CHSCDF	=	Compute the chi-square cumulative distribution function.
CHSPDF	=	Compute the chi-square probability density function.
CHSPPF	=	Compute the chi-square percent point function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
TCDF	=	Compute the T cumulative distribution function.
TPDF	=	Compute the T probability density function.
TPPF	=	Compute the T percent point function.

REFERENCE

"Continuous Univariate Distributions - 2," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 26).

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegum, National Bureau of Standards, 1964 (page 946-947).

APPLICATIONS

Hypothesis Testing

IMPLEMENTATION DATE

Pre-1987

PROGRAM

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SEGMENT 1 COORDINATES 16 88 21 88; SEGMENT 1 PATTERN SOLID
SEGMENT 2 COORDINATES 16 84 21 84; SEGMENT 2 PATTERN DASH
SEGMENT 3 COORDINATES 16 80 21 80; SEGMENT 3 PATTERN DOT
SEGMENT 4 COORDINATES 16 76 21 76; SEGMENT 4 PATTERN DASH2
LEGEND 1 NU1 = 5, NU2 = 5; LEGEND 1 COORDINATES 22 87
LEGEND 2 NU1 = 5, NU2 = 10; LEGEND 2 COORDINATES 22 83
LEGEND 3 NU1 = 10, NU2=5; LEGEND 3 COORDINATES 22 79
LEGEND 4 NU1 = 10, NU2 = 10; LEGEND 4 COORDINATES 22 75
XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
YLIMITS 0 5
TITLE FPPF FOR VARIOUS VALUES OF NU
X1LABEL PROBABILITY
Y1LABEL X
LINES SOLID DASH DOT DASH2
PLOT FPPF(X,5,5) FOR X = 0.01 .01 0.95 AND
PLOT FPPF(X,5,10) FOR X = 0.01 .01 0.95 AND
PLOT FPPF(X,10,5) FOR X = 0.01 .01 0.95 AND
PLOT FPPF(X,10,10) FOR X = 0.01 .01 0.95
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