TPPF

PURPOSE
Compute the t percent point function with υ degrees of freedom.

DESCRIPTION
The t probability density function is:

$$f(x) = \frac{1}{BETA\left(\frac{1}{2}, \frac{1}{2}\upsilon\right)\sqrt{\upsilon}}\left(1 + \frac{x^2}{\upsilon}\right)^{\frac{-(\upsilon + 1)}{2}}$$ **(EQ 8-317)**

where υ is a positive inter that specifies the degrees of freedom, x can be any real number, and BETA is the Beta function (see the documentation for the BETA command in the Mathematical Library Functions chapter for a description of this function).

The t percent point function does not have a general, simple, closed form (except for the special cases of 1 and 2 degrees of freedom). It is calculated with a numerical approximation.

SYNTAX
LET <y2> = TPPF(<y1>,<nu>)   <SUBSET/EXCEPT/FOR qualification>
where <y1> is a variable, a number, or a parameter;
> <y2> is a variable or a parameter (depending on what <y1> is) where the computed t ppf value is stored;
> <nu> is a positive integer number or parameter that specifies the degrees of freedom;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES
LET A = TPPF(0.9,10)
LET Y = TPPF(P,10)

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS
TCDF	=	Compute the T cumulative distribution function.
TPDF	=	Compute the T probability density function.
CHSCDF	=	Compute the chi-square cumulative distribution function.
CHSPDF	=	Compute the chi-square probability density function.
FCDF	=	Compute the F cumulative distribution function.
FPDF	=	Compute the F probability density function.
FPPF	=	Compute the F percent point function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
WEICDF	=	Compute the Weibull cumulative distribution function.
WEIPDF	=	Compute the Weibull probability density function.
WEIPPF	=	Compute the Weibull percent point function.

REFERENCE
"Continuous Univariate Distributions - 2," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 27).

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegum, National Bureau of Standards, 1964 (page 948).

"Statistical Distributions," 2nd Ed., Evans, Hastings, and Peacock, Wiley and Sons, 1993 (chapter 37).

"Extended Tables of the Percentage Points of Student's T Distribution," Federigho, Journal of the American Statistical Association, 1969, (pp. 683-688).

APPLICATIONS

Hypothesis Testing

IMPLEMENTATION DATE

Pre-1987

PROGRAM

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TITLE TPPF FOR VARIOUS VALUES OF NU
Y1LABEL X; X1LABEL PROBABILITY
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 DA2
LEGEND 1 NU = 5; LEGEND 1 COORDINATES 22 87
LEGEND 2 NU = 10; LEGEND 2 COORDINATES 22 83
LEGEND 3 NU = 20; LEGEND 3 COORDINATES 22 79
LEGEND 4 NU = 30; LEGEND 4 COORDINATES 22 75
XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
LINES SOLID DASH DOT DASH2
PLOT TPPF(X,5) FOR X = 0.01 .01 0.99 AND
PLOT TPPF(X,10) FOR X = 0.01 .01 0.99 AND
PLOT TPPF(X,20) FOR X = 0.01 .01 0.99 AND
PLOT TPPF(X,30) FOR X = 0.01 .01 0.99
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