

TPDF**PURPOSE**

Compute the t probability density function with ν degrees of freedom.

DESCRIPTION

The t probability density function is:

$$f(x) = \frac{1}{\text{BETA}\left(\frac{1}{2}, \frac{1}{2}\nu\right)\sqrt{\nu}} \left(1 + \frac{x^2}{\nu}\right)^{-\frac{(\nu+1)}{2}} \quad (\text{EQ 8-316})$$

where ν is a positive integer 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).

SYNTAX

LET <y2> = TPDF(<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 pdf value is stored;

<nu> is a positive number, parameter, or variable that specifies the degrees of freedom;

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

EXAMPLES

LET A = TPDF(3,10)

LET Y = TPDF(X1,10)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

TCDF	=	Compute the T cumulative distribution function.
TPPF	=	Compute the T percent point 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.
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 Stegun, 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 TPDF FOR VARIOUS VALUES OF NU
XILABEL X
YLABEL PROBABILITY
SEGMENT 1 COORDINATES 71 88 76 88; SEGMENT 1 PATTERN SOLID
SEGMENT 2 COORDINATES 71 84 76 84; SEGMENT 2 PATTERN DASH
SEGMENT 3 COORDINATES 71 80 76 80; SEGMENT 3 PATTERN DOT
SEGMENT 4 COORDINATES 71 76 76 76; SEGMENT 4 PATTERN DA2
LEGEND 1 NU = 5; LEGEND 1 COORDINATES 77 87
LEGEND 2 NU = 10; LEGEND 2 COORDINATES 77 83
LEGEND 3 NU = 20; LEGEND 3 COORDINATES 77 79
LEGEND 4 NU = 30; LEGEND 4 COORDINATES 77 75
YLIMITS 0 0.4
MAJOR YTIC NUMBER 5
MINOR YTIC NUMBER 1
YTIC DECIMAL 1
LINES SOLID DASH DOT DASH2
PLOT TPDF(X,5) FOR X = -4 0.1 4 AND
PLOT TPDF(X,10) FOR X = -4 0.1 4 AND
PLOT TPDF(X,20) FOR X = -4 0.1 4 AND
PLOT TPDF(X,30) FOR X = -4 0.1 4
    
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