CHSPDF

PURPOSE
Compute the chi-square probability density function with degrees of freedom parameter ν.

DESCRIPTION
The input value should be greater than 0 and the degrees of freedom parameter ν should be a positive integer. The chi-square distribution has the following probability density function:

$$f(x) = \frac{x^{\left(\frac{\nu}{2}-1\right)}e^{\left(\frac{-x}{2}\right)}}{2^{\nu/2}\Gamma\left(\frac{\nu}{2}\right)} \qquad \text{for } x > 0 \qquad \textbf{(EQ 8-142)}$$

The chi-square distribution has mean ν and standard deviation sqrt(2*ν).

SYNTAX
LET <y2> = CHSPDF(<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 chi-square pdf 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 = CHSPDF(3,10)
LET Y = CHSPDF(X1,10)
LET Y = CHSPDF(X1,NU)

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS

CHSCDF	=	Compute the chi-square cumulative distribution function.
CHSPPF	=	Compute the chi-square percent point function.
NCCCDF	=	Compute the non-central chi-square cumulative distribution function.
NCCPPF	=	Compute the non-central 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.
TCDF	=	Compute the t cumulative distribution function.
TPDF	=	Compute the t probability density function.
TPPF	=	Compute the t percent point function.
GAMCDF	=	Compute the gamma cumulative distribution function.
GAMPPF	=	Compute the gamma percent point function.

REFERENCE
"Continuous Univariate Dsitributions - 1," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 17).

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegum, National Bureau of Standards, 1964 (page 941).

APPLICATIONS
Hypothesis Testing

IMPLEMENTATION DATE
> Pre-1987

PROGRAM
> TITLE CHSPDF FOR VARIOUS VALUES OF NU
> X1LABEL X
> Y1LABEL 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 0.2
> MAJOR YTIC NUMBER 5
> MINOR YTIC NUMBER 1
> YTIC DECIMAL 2
> LINES SOLID DASH DOT DASH2
> PLOT CHSPDF(X,5) FOR X = 0 .1 30 AND
> PLOT CHSPDF(X,10) FOR X = 0 .1 30 AND
> PLOT CHSPDF(X,20) FOR X = 0 .1 30 AND
> PLOT CHSPDF(X,30) FOR X = 0 .1 30