NORSF

PURPOSE

Compute the standard form of the normal sparsity function.

DESCRIPTION

The standard form of the normal probability density function is:

$$f(x) = \left(\frac{1}{\sqrt{2\pi}}\right)e^{-\frac{x^2}{2}} \tag{EQ 8-291}$$

The sparsity function is calculated as:

$$sf(p) = \frac{\sqrt{2\pi}}{e^{\frac{-(\Phi^{-1}(p))}{2}}} \tag{EQ 8-292}$$

where Φ^{-1} is the normal percent point function. The input value is a real number between 0 and 1.

SYNTAX

LET <y2> = NORSF(<y1>)   <SUBSET/EXCEPT/FOR qualification>
where <y1> is a variable, a number, or a parameter in the range 0 to 1;
        <y2> is a variable or a parameter (depending on what <y1> is) where the computed normal sf value is stored;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = NORSF(0.9)
LET Y = NORSF(X1)

NOTE

The general form of the normal probability density function is:

$$f(x) = \left(\frac{1}{\sigma\sqrt{2\pi}}\right)e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \tag{EQ 8-293}$$

where μ is the location parameter and σ is the scale parameter. See topic (3) under the General considerations section at the beginning of this chapter for a discussion of generating sparsity function values for the general form of the distribution. The mean is μ and the standard deviation is σ.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
HFNCDF	=	Compute the half-normal cumulative distribution function.
HFNPDF	=	Compute the half-normal probability density function.
HFNPPF	=	Compute the half-normal percent point function.
LGNCDF	=	Compute the lognormal cumulative distribution function.
LGNPDF	=	Compute the lognormal probability density function.
LGNPPF	=	Compute the lognormal 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.
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," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 13).

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

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

```
XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
TITLE AUTOMATIC
X1LABEL PROBABILITY
Y1LABEL X
PLOT NORSF(X) FOR X = 0.01 .01 0.99
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PLOT NORSF(X) FOR X = 0.01 .01 0.99