

WCAPPF**PURPOSE**

Compute the standard wrapped-up Cauchy percent point function.

DESCRIPTION

The standard wrapped-up Cauchy distribution has the following probability density function:

$$f(x, p) = \frac{1 - p^2}{2\pi(1 + p^2 - 2p \cos(x))} \quad 0 \leq x < 2\pi \quad \text{(EQ Aux-331)}$$

where p is a shape parameter. The percent point function is computed numerically using a bisection method. This distribution can be used as an alternative to the Von Mises distribution for symmetric, circular data.

SYNTAX

LET <y> = WCAPPF(<x>,<p>) <SUBSET/EXCEPT/FOR qualification>

where <x> is a number, parameter, or variable in the range (0,1);

<p> is a number, parameter, or variable in the range (0,1) that specifies the shape parameter;

<y> is a variable or a parameter (depending on what <x> is) where the computed wrapped-up Cauchy ppf value is saved; and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = WCAPPF(0.95,0.5)

LET X2 = WCAPPF(X1,P)

NOTE

The general form of the wrapped-up Cauchy probability density function is:

$$f(x, p) = \frac{1 - p^2}{2\pi(1 + p^2 - 2p \cos(x - \mu))} \quad 0 \leq x < 2\pi \quad \text{(EQ Aux-332)}$$

where μ is a location parameter.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

WCACDF	=	Compute the wrapped-up Cauchy cumulative distribution function.
WCAPDF	=	Compute the wrapped-up Cauchy probability density function.
CAUCDF	=	Compute the Cauchy cumulative distribution function.
CAUPDF	=	Compute the Cauchy probability density function.
CAUPPF	=	Compute the Cauchy percent point function.
VONCDF	=	Compute the normal cumulative distribution function.
VONPDF	=	Compute the normal probability density function.
VONPPF	=	Compute the normal percent point function.

REFERENCE

"Continuous Univariate Distributions - Vol. 1," 2nd. Ed., Johnson, Kotz, and Balakrishnan, John Wiley and Sons, 1994 (pp. 327-329).

APPLICATIONS

Circular Distributions

IMPLEMENTATION DATE

95/10

PROGRAM

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Y1LABEL X
X1LABEL PROBABILITY
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MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 100
LET P = 0.1
TITLE WRAPPED CAUCHY DISTRIBUTION - P = ^P
PLOT WCAPPF(X,P) FOR X = 0 0.01 1
LET P = 0.5
TITLE WRAPPED CAUCHY DISTRIBUTION - P = ^P
PLOT WCAPPF(X,P) FOR X = 0 0.01 1
LET P = 0.9
TITLE WRAPPED CAUCHY DISTRIBUTION - P = ^P
PLOT WCAPPF(X,P) FOR X = 0 0.01 1
LET P = 0.0
TITLE WRAPPED CAUCHY DISTRIBUTION - P = ^P
PLOT WCAPPF(X,P) FOR X = 0 0.01 1
END OF MULTIPLY
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