ARSPDF

PURPOSE

Compute the arc-sine probability density function.

DESCRIPTION

The arc-sine distribution has the following probability density function:

$$f(x) = \frac{1}{\pi\sqrt{x(1-x)}} \qquad 0 < x < 1 \qquad \textbf{(EQ Aux-17)}$$

The arc-sine distribution is a special case of the beta distribution with both parameters equal to 1/2. The generalized arc-sine distribution is the special case of the beta distribution where the 2 parameters sum to 1 but are not necessarily equal to 1/2. The generalized arc-sine probability functions can be computed using the beta probability distributions in DATAPLOT (see the Related Commands section below).

Johnson, Kotz, and Balakrishnan (see the Reference section below give a derivation of this distribution based on random walks.

SYNTAX

LET <y> = ARSPDF(<x>) <SUBSET/EXCEPT/FOR qualification>

where <x> is a number, parameter, or variable;

<y> is a variable or a parameter (depending on what <x> is) where the computed arc-sine pdf value is stored;

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

EXAMPLES

LET A = ARSPDF(3)

LET Y = ARSPDF(X1)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

ARSCDF	=	Compute the arc-sine cumulative distribution function.
ARSPPF	=	Compute the arc-sine percent point function.
BETCDF	=	Compute the beta cumulative distribution function.
BETPDF	=	Compute the beta probability density function.
BETPPF	=	Compute the beta percent point function.

REFERENCE

“Continuous Univariate Distributions - Volume 2,” 2nd Ed., Johnson, Kotz, and Balakrishnan, Wiley and Sons (pages 212, 253).

IMPLEMENTATION DATE

95/9

PROGRAM

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TITLE AUTOMATIC
PLOT ARSPDF(X) FOR X = 0.01 0.01 0.99
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