CAUSF

PURPOSE
Compute the standard Cauchy (i.e., median=0, 75% point at 1) sparsity function.

DESCRIPTION
The standard form of the Cauchy probability density function is:

\[ f(x) = \frac{1}{\pi(1 + x^2)} \]

\(\text{EQ 8-136}\)

The standard form of the Cauchy sparsity function is:

\[ sf(p) = \frac{\pi}{(\sin(\pi p))^{2}} \]

\(\text{EQ 8-137}\)

The input value is a real number between 0 and 1.

SYNTAX
LET <y2> = CAUSF(<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 Cauchy sf value is stored;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES
LET A = CAUSF(0.9)
LET Y = CAUSF(P)

NOTE
The general form of the Cauchy probability density function is:

\[ f(x) = \left(\frac{1}{s}\right)\frac{1}{\pi\left(1 + \left(\frac{x-t}{s}\right)^{2}\right)} \]

\(\text{EQ 8-138}\)

where \(t\) and \(s\) are the location and scale parameters respectively. The general form of the Cauchy sparsity function is:

\[ sf(p) = \frac{s\pi}{(\sin(\pi p))^{2}} \]

\(\text{EQ 8-139}\)

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.

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS

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<th>Command</th>
<th>Description</th>
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<tr>
<td>CAUCDF</td>
<td>Compute the Cauchy cumulative distribution function.</td>
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<tr>
<td>CAUPDF</td>
<td>Compute the Cauchy probability density function.</td>
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<tr>
<td>CAUPPF</td>
<td>Compute the Cauchy percent point function.</td>
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<tr>
<td>NORCDF</td>
<td>Compute the normal cumulative distribution function.</td>
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<td>TCDF</td>
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<td>Compute the T percent point function.</td>
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REFERENCE


APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

XLIMITS 0 1
MAJOR XTIC NUMBER 6
MINOR XTIC NUMBER 1
XTIC DECIMAL 1
TITLE AUTOMATIC
PLOT CAUSF(X) FOR X = 0.01 .01 0.99