BRAPPF

PURPOSE

Compute the Bradford percent point function.

DESCRIPTION

The Bradford probability density function is:

\[ f(x, \beta) = \frac{\beta}{\log(1 + \beta)(1 + \beta x)} \quad 0 < x < 1, \beta > -1 \]  

(EQ Aux-49)

where \( \beta \) is the shape parameter.

The percent point function is the inverse of the cumulative distribution function. The cumulative distribution sums the probability from 0 to the given \( x \) value (i.e., the integral of the above function). The percent point function takes a cumulative probability value and computes the corresponding \( x \) value. It has the following formula:

\[ G(p, \beta) = \frac{e^{p \log(1 + \beta) - 1}}{\beta} \quad 0 < p < 1, \beta > -1 \]  

(EQ Aux-50)

The input value is a real number between 0 and 1 (since it corresponds to a probability).

SYNTAX

```
LET <y> = BRAPPF(<p>,<beta>) <SUBSET/EXCEPT/FOR qualification>
```

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

<\( y \)> is a variable or a parameter (depending on what <\( p \)> is) where the computed Bradford ppf value is stored;

<\( \beta \)> is a number, parameter, or variable that specifies the shape parameter;

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

EXAMPLES

```
LET A = BRAPPF(0.9,0.7)
LET X2 = BRAPPF(P,BETA)
```

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

- BRACDF = Compute the Bradford cumulative distribution function.
- BRAPDF = Compute the Bradford probability density function.
- WARCDF = Compute the Waring cumulative distribution function.
- WARPDF = Compute the Waring probability density function.
- PARCDF = Compute the Pareto cumulative distribution function.
- PARPDF = Compute the Pareto probability density function.
- BETCDF = Compute the beta cumulative distribution function.
- BETPDF = Compute the beta probability density function.
- BETPPF = Compute the beta percent point function.

REFERENCE


APPLICATIONS

Approximation to the Zipf or Yule discrete distributions

IMPLEMENTATION DATE

96/2
PROGRAM
XLIMITS 0 1
MAJOR XTCIC MARK NUMBER 6
XTIC OFFSET 0.1 0.1
MULTIPLYOT 2 2; MULTIPLYOT CORNER COORDINATES 0 0 100 100
TITLE AUTOMATIC
LET B = -0.5
X1LABEL BETA = $^B$
PLOT BRAPPF(P,B) FOR P = 0.01 0.01 0.99
LET B = 0.5
X1LABEL BETA = $^B$
PLOT BRAPPF(P,B) FOR P = 0.01 0.01 0.99
LET B = 1.0
X1LABEL BETA = $^B$
PLOT BRAPPF(P,B) FOR P = 0.01 0.01 0.99
LET B = 2.0
X1LABEL BETA = $^B$
PLOT BRAPPF(P,B) FOR P = 0.01 0.01 0.99
END OF MULTIPLYOT