

RIGPPF**PURPOSE**

Compute the reciprocal inverse Gaussian percent point function with shape parameter γ .

DESCRIPTION

The probability density function for the reciprocal inverse Gaussian distribution can be defined in terms of the inverse Gaussian distribution. Specifically,

$$f(x) = \frac{\text{igpdf}\left(\frac{1}{x}, \gamma\right)}{x^2} \quad \text{for } x \geq 0 \quad \text{(EQ 8-309)}$$

where `igpdf` is the probability density function for the inverse Gaussian distribution (see the documentation for the `IGPDF` command in this chapter for the formula for this distribution) and γ is the shape parameter. As with the inverse Gaussian distribution, `DATAPLOT` assumes the location parameter, μ , is 1. See topic (3) under the General considerations section at the beginning of this chapter for a discussion of generating pdf values for the general form of the distribution.

The percent point function has the formula:

$$G(p, \gamma) = \frac{1}{\text{igppf}(1-p, \gamma)} \quad \text{(EQ 8-310)}$$

where `igppf` is the percent point function of the inverse Gaussian distribution.

SYNTAX

LET <y2> = RIGPPF(<y1>, GAMMA) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a variable, a number, or a parameter containing values in the range 0 to 1;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed reciprocal inverse Gaussian ppf value is stored;

<GAMMA> is a positive number or parameter that specifies the shape parameter;

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

EXAMPLES

LET A = RIGPPF(0.9,10)

LET Y = RIGPPF(P,10)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

RIGCDF	=	Compute the reciprocal inverse Gaussian cumulative distribution function.
RIGPDF	=	Compute the reciprocal inverse Gaussian probability density function.
IGPDF	=	Compute the inverse Gaussian probability density function.
IGPPF	=	Compute the inverse Gaussian percent point function.
IGCDF	=	Compute the inverse Gaussian cumulative distribution function.
WEICDF	=	Compute the Weibull cumulative distribution function.
WEIPDF	=	Compute the Weibull probability density function.
WEIPPF	=	Compute the Weibull percent point function.
FLPDF	=	Compute the fatigue-life probability density function.
FLPPF	=	Compute the fatigue-life percent point function.
FLCDF	=	Compute the fatigue-life cumulative distribution function.

REFERENCE

“Continuous Univariate Distributions - 1,” Johnson and Kotz, Houghton Mifflin, 1970 (chapter 15).

APPLICATIONS

Reliability Analysis

IMPLEMENTATION DATE

90/5 (definition of inverse Gaussian distribution was modified 95/1 to be consistent with Johnson and Kotz)

PROGRAM

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TITLE RIGPPF FOR VARIOUS VALUES OF GAMMA
XILABEL PROBABILITY
YILABEL X
SEGMENT 1 COORDINATES 16 88 21 88; SEGMENT 1 PATTERN SOLID
SEGMENT 2 COORDINATES 16 84 21 84; SEGMENT 2 PATTERN DASH
SEGMENT 3 COORDINATES 16 80 21 80; SEGMENT 3 PATTERN DOT
SEGMENT 4 COORDINATES 16 76 21 76; SEGMENT 4 PATTERN DA2
LEGEND 1 GAMMA = 1; LEGEND 1 COORDINATES 22 87
LEGEND 2 GAMMA = 2; LEGEND 2 COORDINATES 22 83
LEGEND 3 GAMMA = 5; LEGEND 3 COORDINATES 22 79
LEGEND 4 GAMMA = .5; LEGEND 4 COORDINATES 22 75
XLIMITS 0 1; XTIC DECIMAL 1
MAJOR XTIC NUMBER 6; MINOR XTIC NUMBER 1
LINES SOLID DASH DOT DASH2
PLOT RIGPPF(X,1) FOR X = 0.01 .01 0.99 AND
PLOT RIGPPF(X,2) FOR X = 0.01 .01 0.95 AND
PLOT RIGPPF(X,5) FOR X = 0.01 .01 0.60 AND
PLOT RIGPPF(X,0.5) FOR X = 0.01 .01 0.99

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