

RIGPDF**PURPOSE**

Compute the reciprocal inverse Gaussian probability density 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,

$$f(x) = \frac{\text{igpdf}\left(\frac{1}{x}, \gamma\right)}{x^2} \quad \text{for } x \geq 0 \quad (\text{EQ 8-308})$$

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 mean of the reciprocal inverse Gaussian distribution is μ (i.e., the location parameter) and the standard deviation is $\mu\gamma*\text{SQRT}(1 + 2*\gamma^2)$

SYNTAX

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

where <y1> is a variable, a number, or a parameter containing positive values;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed reciprocal inverse Gaussian pdf values are 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 = RIGPDF(3,10)

LET Y = RIGPDF(X1,10)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

RIGCDF	=	Compute the reciprocal inverse Gaussian cumulative distribution function.
RIGPPF	=	Compute the reciprocal inverse Gaussian percent point 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.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point 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

```

TITLE RIGPDF FOR VARIOUS VALUES OF GAMMA
XILABEL X
YILABEL PROBABILITY
SEGMENT 1 COORDINATES 69 88 74 88; SEGMENT 1 PATTERN SOLID
SEGMENT 2 COORDINATES 69 84 74 84; SEGMENT 2 PATTERN DASH
SEGMENT 3 COORDINATES 69 80 74 80; SEGMENT 3 PATTERN DOT
SEGMENT 4 COORDINATES 69 76 74 76; SEGMENT 4 PATTERN DA2
LEGEND 1 GAMMA = 1; LEGEND 1 COORDINATES 75 87
LEGEND 2 GAMMA = 2; LEGEND 2 COORDINATES 75 83
LEGEND 3 GAMMA = 5; LEGEND 3 COORDINATES 75 79
LEGEND 4 GAMMA = .5; LEGEND 4 COORDINATES 75 75
LINES SOLID DASH DOT DASH2
PLOT RIGPDF(X,1) FOR X = 0.01 0.01 3 AND
PLOT RIGPDF(X,2) FOR X = 0.01 0.01 3 AND
PLOT RIGPDF(X,5) FOR X = 0.01 0.01 3 AND
PLOT RIGPDF(X,0.5) FOR X = 0.05 0.01 3

```

