

ALPPDF**PURPOSE**

Compute the alpha probability density function with shape parameters α and β .

DESCRIPTION

The alpha distribution has the following probability density function:

$$f(x, \alpha, \beta) = \frac{\beta \phi\left(\alpha - \frac{\beta}{x}\right)}{x^2 \Phi(\alpha)} \quad x > 0 \quad (\text{EQ Aux-7})$$

where ϕ is the standard normal density function and Φ is the standard normal cumulative distribution function. See the documentation for the NORPDF and NORCDF commands for a description of the standard normal density and distribution functions. The shape parameters alpha and beta should be positive.

SYNTAX

LET <y2> = ALPPDF(<y1>,<a>,) <SUBSET/EXCEPT/FOR qualification>

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

<y2> is a variable or a parameter (depending on what <y1> is) where the computed alpha pdf value is stored;

<a> is a positive number, parameter, or variable that specifies the first shape parameter;

 is a positive number, parameter, or variable that specifies the second shape parameter;

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

EXAMPLES

LET A = ALPPDF(0.3,10,8)

LET A = ALPPDF(A1,10,8)

LET X2 = ALPPDF(X1,2,6)

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

ALPCDF	=	Compute the alpha cumulative distribution function.
ALPPPF	=	Compute the alpha percent point function.
WEICDF	=	Compute the Weibull cumulative distribution function.
WEIPDF	=	Compute the Weibull probability density function.
WEIPPF	=	Compute the Weibull percent point function.
LGNCDF	=	Compute the log-normal cumulative distribution function.
LGNPDF	=	Compute the log-normal probability density function.
LGNPPF	=	Compute the log-normal percent point function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.

REFERENCE

"Reliability Applications of the Alpha Distribution," Salvia, IEEE Transactions On Reliability, Vol. R-34, August, 1985, (pp. 251-252).

"Continuous Univariate Distributions," 2nd. ed., Johnson, Kotz, and Balakrishnan, John Wiley and Sons, 1994.

APPLICATIONS

Reliability, accelerated life testing

IMPLEMENTATION DATE

95/5

PROGRAM

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MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 100
TITLE AUTOMATIC
LET A = 2
LET B = 1
X1LABEL ALPHA = ^A, BETA = ^B
PLOT ALPPDF(X,A,B) FOR X = 0.01 0.01 7
LET A = 0.5
LET B = 6
X1LABEL ALPHA = ^A, BETA = ^B
PLOT ALPPDF(X,A,B) FOR X = 0.1 0.1 100
LET A = 6
LET B = 0.5
X1LABEL ALPHA = ^A, BETA = ^B
PLOT ALPPDF(X,A,B) FOR X = 0.001 0.001 0.2
LET A = 0.5
LET B = 0.5
X1LABEL ALPHA = ^A, BETA = ^B
PLOT ALPPDF(X,A,B) FOR X = 0.01 0.01 7
END OF MULTIPLY
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