

POCH**PURPOSE**

Compute a generalization of Pochhammer's symbol.

DESCRIPTION

Pochhammer's symbol represents ascending factorials and is defined to be:

$$(n)_k = n(n+1) \dots (n+k-1) \quad \text{(EQ Aux-280)}$$

for integer n and k. This reduces to $(n+k-1)!/(n-1)!$.

Analogous to the fact that the integer factorial function can be generalized to real numbers via the gamma function, Pochhammer's symbol can also be generalized to real numbers. Pochhammer's generalized symbol is defined to be:

$$(a)_x = \frac{\Gamma(a+x)}{\Gamma(a)} \quad \text{(EQ Aux-281)}$$

where Γ is the gamma function. See the documentation for the GAMMA command for a description of the gamma function.

SYNTAX

LET <y> = POCH(<x>,<a>) <SUBSET/EXCEPT/FOR qualification>

where <x> is a number, parameter or variable;

<a> is a number, parameter, or variable;

<y> is a variable or a parameter (depending on what <x> and <a> are) where the computed values are stored;

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

EXAMPLES

LET P = POCH(2.3,1)

LET A = POCH(X,A1)

LET X2 = POCH(X1,4.2)

NOTE 1

DATAPLOT uses the routine DPOCH from the SLATEC Common Mathematical Library to compute this function. SLATEC is a large set of high quality, portable, public domain Fortran routines for various mathematical capabilities maintained by seven federal laboratories.

NOTE 2

Pochhammer's symbol is defined to be ...

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

POCHI	=	Compute a generalization of Pochhammer's symbol starting from the first order.
GAMMA	=	Compute the gamma function.
LOGGAMMA	=	Compute the log (to base e) gamma function.
GAMMAIP	=	Compute an alternate form of the incomplete gamma function.
GAMMAIC	=	Compute the complementary incomplete Gamma function.
GAMMAR	=	Compute the reciprocal gamma function.
TRICOMI	=	Compute Tricomi's incomplete gamma function.
DIGAMMA	=	Compute the digamma function.

REFERENCE

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegun, National Bureau of Standards, 1964 (chapter 6).

APPLICATIONS

Special Functions

IMPLEMENTATION DATE

94/9

PROGRAM

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TITLE AUTOMATIC
MULTIPLY 2 2; MULTIPLY CORNER COORDINATES 0 0 100 100
LET A = 0.1; XILABEL A = ^A
PLOT POCH(X,A) FOR X = 0.01 0.01 3
LET A = 0.5; XILABEL A = ^A
PLOT POCH(X,A) FOR X = 0.01 0.01 3
LET A = 1.0; XILABEL A = ^A
PLOT POCH(X,A) FOR X = 0.01 0.01 3
LET A = 2.5; XILABEL A = ^A
PLOT POCH(X,A) FOR X = 0.01 0.01 3
END OF MULTIPLY
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