

BESSIO**PURPOSE**

Compute the modified Bessel function of order 0.

DESCRIPTION

The modified Bessel function of the first kind with order ν (ν is a non-negative real number) can be defined as:

$$I_{\nu}(x) = \left(\frac{x}{2}\right)^{\nu} \sum_{k=0}^{\infty} \frac{\left(\frac{x^2}{4}\right)^k}{k! \Gamma(\nu + k + 1)} \quad (\text{EQ Aux-27})$$

where Γ is the Gamma function and $!$ is the factorial function.

SYNTAX

LET <y2> = BESSIO(<y1>) <SUBSET/EXCEPT/FOR qualification>
 where <y1> is a number, variable or parameter;
 <y2> is a variable or parameter (depending on what <y1> is) where the computed Bessel value is stored;
 and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

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LET X2 = BESSIO(2)
LET A = BESSIO(X)
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NOTE

DATAPLOT uses the routine BESIO 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.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

BESSI1	=	Compute the modified Bessel function of order 1.
BESSIOE	=	Compute the exponentially scaled modified Bessel function of order 0.
BESSIN	=	Compute the modified Bessel function of order N.
BESSINE	=	Compute the exponentially scaled modified Bessel function of order N.
BESSJN	=	Compute the Bessel function of the first kind and order N.
BESSIN	=	Compute the modified Bessel function of order N.
BESSKN	=	Compute the modified Bessel function of the third kind and order N.

REFERENCE

"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegun, National Bureau of Standards, 1964 (pages 355-433).

"Numerical Recipes: The Art of Scientific Computing (FORTRAN Version)," 2nd Edition, Press, Flannery, Teukolsky, and Vetterling. Cambridge University Press, 1992 (chapter 6).

APPLICATIONS

Special Functions

IMPLEMENTATION DATE

94/9

PROGRAM

TITLE AUTOMATIC

PLOT BESSI0(X) FOR X = -5 0.01 5

