LOGINT

PURPOSE
Compute the logarithmic integral.

DESCRIPTION
The logarithmic integral is defined as:

$$\mathrm{li}(x) = \int_0^x \frac{1}{\ln(x)}\,dt \qquad x > 0, \ x <> 1 \qquad \textbf{(EQ Aux-239)}$$

SYNTAX
LET <y> = LOGINT(<x>)   <SUBSET/EXCEPT/FOR qualification>

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

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

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

EXAMPLES
LET A = LOGINT(0.1)
LET A = LOGINT(10)
LET X2 = LOGINT(X)

NOTE

DATAPLOT uses the routine ALI 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
EXPINT1	=	Compute the exponential integral of order 1.
EXPINTN	=	Compute the exponential integral of order N.
EXPINTE	=	Compute the principla value of the exponential integral.
ERF	=	Compute the error function.
SININT	=	Compute the sine integral.
COSINT	=	Compute the cosine integral.

REFERENCE
"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegun, National Bureau of Standards, 1964 (chapter 5).

APPLICATIONS
Special Functions

IMPLEMENTATION DATE
94/9

PROGRAM

      TITLE LOGARITHMIC INTEGRAL
      PLOT LOGINT(X) FOR X = 0.01 0.01 0.99 AND
      PLOT LOGINT(X) FOR X = 1.01 0.01 9.99