FRESNF

PURPOSE
Compute the Fresnel auxillary function f.

DESCRIPTION
The Fresnel auxillary function f is defined as:)

$$f(x) = \left(\frac{1}{2} - S(x)\right)\cos\left(\frac{\pi x^2}{2}\right) - \left(\frac{1}{2} - C(x)\right)\sin\left(\frac{\pi x^2}{2}\right) \qquad \textbf{(EQ Aux-146)}$$

where S is the Fresnel sine integral function and C is the Fresnel cosine integral function.

SYNTAX
LET <y> = FRESNF(<x>)   <SUBSET/EXCEPT/FOR qualification>
where <x> is a number, variable, or parameter;
    <y> is a variable or a parameter (depending on what <x> is where the computed FRESNF integral values are stored;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES
LET A = FRESNF(0.1)
LET A = FRESNF(X)

NOTE
DATAPLOT uses ACM algorithm 723 from the ACM Transactions of Mathematical Software (see the REFERENCE section below) to compute the Fresnel integrals and Fresnel auxillary functions.

DEFAULT
None

SYNONYMS
None

RELATED COMMANDS
FRESNC	=	Compute the Fresnel cosine integral.
FRESNS	=	Compute the Fresnel sine integral.
FRESNG	=	Compute the Fresnel auxillary function g.
DAWS	=	Compute the Dawson integral.
ERF	=	Compute the error function.
ERFC	=	Compute the complementary error function.
SININT	=	Compute the sine integral.
SININT	=	Compute the cosine integral.
EXPINTN	=	Compute the exponential integral of order N.
LOGINT	=	Compute the logarithmic integral.

REFERENCE
"Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55," Abramowitz and Stegun, National Bureau of Standards, 1964 (chapter 7).

"Algorithm 723: Fresnel Integrals," Snyder, ACM Transactions on Mathematical Software, Volume 19, Number 4, 1993, (pp. 452-456).

APPLICATIONS
Special Functions

IMPLEMENTATION DATE
94/11

PROGRAM
>   TITLE AUTOMATIC
>   PLOT FRESNF(X) FOR X = -5 0.01 5

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