# COSCDF

## PURPOSE

Compute the cosine cumulative distribution function.

## DESCRIPTION

The cosine distribution has the following probability density function:

$$f(x) = \frac{1 + \cos(x)}{2\Pi} \qquad -\Pi \leq x \leq \Pi \qquad \textbf{(EQ Aux-76)}$$

The cumulative distribution is the area under the curve from -PI to x (i.e., the integral of the above function). It has the formula:

$$F(x) = \frac{\Pi + x + \sin(x)}{2\Pi} \qquad -\Pi \leq x \leq \Pi \qquad \textbf{(EQ Aux-77)}$$

## SYNTAX

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

## EXAMPLES

LET A = COSCDF(3)
LET A = COSCDF(A1)

## DEFAULT

None

## SYNONYMS

None

## RELATED COMMANDS

| | | |
|---|---|---|
| COSPDF | = | Compute the cosine probability density function. |
| COSPPF | = | Compute the cosine percent point function. |
| NORCDF | = | Compute the normal cumulative distribution function. |
| NORPDF | = | Compute the normal probability density function. |
| NORPPF | = | Compute the normal percent point function. |
| UNICDF | = | Compute the uniform cumulative distribution function. |
| UNIPDF | = | Compute the uniform probability density function. |
| UNIPPF | = | Compute the uniform percent point function. |

## REFERENCE

"Some Useful Alternatives to the Normal Distribution," Chew, The American Statistician, June, 1968.

## APPLICATIONS

Data Analysis

## IMPLEMENTATION DATE

95/4

PROGRAM

```
TITLE AUTOMATIC
XLIMITS -3 3
XTIC OFFSET 0.2 0.2
LET LOWER = -PI
LET UPPER = PI
PLOT COSCDF(X) FOR X = LOWER 0.01 UPPER
```