

**GEOCDF****PURPOSE**

Compute the geometric cumulative distribution function.

**DESCRIPTION**

The geometric distribution is used when there are exactly two mutually exclusive outcomes of a trial. These outcomes are often called successes and failures. The geometric probability distribution is the distribution of the number of failures before obtaining the first success. It has the following cumulative distribution function:

$$\text{geocdf}(x, p) = 1 - (1 - p)^{x+1} \quad (\text{EQ 8-223})$$

where  $x$  is an integer specifying the number of failures and  $p$  is the probability of a success on a single trial.

**SYNTAX**

LET <y2> = GEOCDF(<y1>,<p>) <SUBSET/EXCEPT/FOR qualification>  
 where <y1> is a non-negative integer variable, number, or parameter;  
 <y2> is a variable or a parameter (depending on what <y1> is) where the computed geometric cdf value is stored;  
 <p> is a number or parameter between 0 and 1 that is the probability of success on a single trial;  
 and where the <SUBSET/EXCEPT/FOR qualification> is optional.

**EXAMPLES**

```
LET A = GEOCDF(3,0.5)
LET Y = GEOCDF(X1,0.3)
```

**DEFAULT**

None

**SYNONYMS**

None

**RELATED COMMANDS**

GEOPDF	=	Compute the geometric probability density function.
GEOPPF	=	Compute the geometric percent point function.
BINCDF	=	Compute the binomial cumulative distribution function.
BINPDF	=	Compute the binomial probability density function.
BINPPF	=	Compute the binomial percent point function.
POIPDF	=	Compute the Poisson probability density function.
POICDF	=	Compute the Poisson cumulative distribution function.
POIPPF	=	Compute the Poisson percent point function.
NBCDF	=	Compute the negative binomial cumulative distribution function.
NBPDF	=	Compute the negative binomial probability density function.
NBPPF	=	Compute the negative binomial percent point function.

**REFERENCE**

“An Introduction to Probability Theory and Its Applications, Volume I,” 2nd edition, Feller, Wiley and Sons, 1957 (pp. 155-157, 210).

“Discrete Univariate Distributions,” Johnson and Kotz, Houghton Mifflin, 1969 (chapter 5).

“Statistical Distributions,” 2nd. Edition, Evans, Hastings, and Peacock, Wiley and Sons, 1993 (chapter 19).

**APPLICATIONS**

Data Analysis

**IMPLEMENTATION DATE**

94/4

## PROGRAM

```
YLIMITS 0 1
MAJOR YTIC NUMBER 6
MINOR YTIC NUMBER 1
YTIC DECIMAL 1
XLIMITS 0 50
XTIC OFFSET 0.5 0.5
LINE BLANK
SPIKE ON
SPIKE THICKNESS 0.3
TITLE AUTOMATIC
X1LABEL NUMBER OF TRIALS TILL FIRST SUCCESS
Y1LABEL PROBABILITY
PLOT GEOCDF(X,0.1) FOR X = 0 1 50
```

