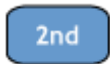# TI-84 Geometric Distribution Function

The geometric distribution, among discrete distributions, refers to a sequence of Bernoulli trials (the only two options are success or failure) where we are concerned with the probability of have X-1 failures before the first success. So unlike a binomial distribution, there is not a fixed number of trials, but we stop counting whenever we get our first success, so this might be the first trial, or never. The geometric distribution is related to the hypergeometric distribution where we are conducting Bernoulli trials up to a fixed number of successes (not equal to one). Our calculator has the geometric distribution, but not the hypergeometric distribution.

To use the geometric distribution in the calculator, go to the DISTR menu by hitting

[2nd] [VARS]. Scroll up to get to the bottom of the list.
The **geometpdf** function is the (particular) probability
distribution for a fixed number of trials in which the first
success occurs. The **geometcdf** is the cummulative
distribution, which sums the probabilities up to the
specified number of trials. We will show the use of each in turn.

```
DISTR DRAW
0:Fcdf(
A:binompdf(
B:binomcdf(
C:poissonpdf(
D:poissoncdf(
E:geometpdf(
F:geometcdf(
```

Suppose that we want to calculate the probability that it will take exactly 4 trials before the first success, if the chance of success with each trial is 30%.

To enter this into the calculator, select **geometpdf(** and then type in the probability of success on each trial, comma, followed by the number of trials. The screenshot shows what your screen

```
geometpdf(.3,4)
          .1029
```

syntax will look like. Press [ENTER] to obtain the value.

```
geometpdf(.3,4)
          .1029
geometcdf(.4,3)
           .784
■
```

The cummulative distribution **geometcdf(** works the same way, with the same syntax. Under the situation described above, suppose we wanted to calculate the probability that it would take no more than 4 trials to obtain the first success, in other words, it would take either one attempt, two attempts, three attempts, or four attempts, but not 5, 6 or more attempts.

geometpdf(p,x)   **geometcdf(p,x)**