# Statistics and Probability on the TI–83/84

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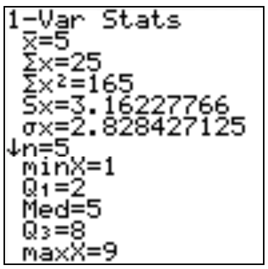
**Entering Data** - Data points are stored in Lists on the TI-83/84. If you haven't used the calculator before, you may want to get rid of everything that was there. You do this by pressing [2nd] [MEM] (above the + sign), select [4:ClrAllLists] and press [ENTER] twice. Then press [STAT] and highlight [5:SetUpEditor] and press [ENTER] twice. You will not have to do this every time that you want to enter a list, but it's a good idea to do it every once in a while.

Press [STAT], select [EDIT... ] this puts you into the List Editor. You will see columns with L1, L2,... going across the top. You can store 6 different sets of data here. Now enter the data pressing [ENTER] after each data point. After the last data point press [ENTER] then [QUIT]. The data is now stored in L1. You can store data in any of the other lists by scrolling across in the list editor.

**Sorting Data** - Once data has been entered into a list, you can rearrange the list into ascending or descending order. To sort L1 in ascending order, press [STAT], select [2:SortA(], [2nd] [L1], (above the number 1). Now if you go back into the list editor, the list has been sorted. To sort in descending order, use the [3:SortD(] function.

**1-Variable Statistics** - To analyze the data {1, 3, 5, 7, 9} enter the data into a list, say L1. Press [STAT], select [CALC], [1:1-Var Stats], press [2nd] [L1], [ENTER]. The calculator displays:

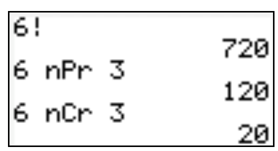



$\bar{x}$ is the mean
$\sum x$ is the sum of the data points
$\sum x^2$ is the sum of the squares of the data points
Sx is the sample standard deviation
$\sigma$x is the population standard deviation

n is the sample size
MinX/MaxX are the minimum and maximum
Med is the median
Q1/ Q3 are the first and third quartiles

**1-Variable Statistics with Repeated or Weighted Data** - For example, say that you have the set of data 1,1,1,1,1,6,6,6. Put the different data points into L1 and the number of repetitions in L2. So L1={1, 6} and L2={5, 3}. Now put the command [1-Var Stats L1,L2] into the calculator and press [ENTER] to get the Statistics. Weighted data is done the same with the data in L1 and the weights in L2.

**Factorials, Permutations, and Combinations** –
to find !, ${}_nP_r$ , ${}_nC_r$ press Math, scroll over to [PRB]. The screen to the right shows how to make the computations

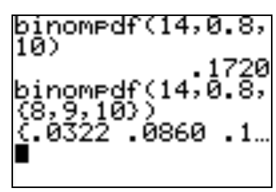



**Binomial/Normal Distributions** – All functions can be found by pressing [2nd] [DISTR].

**Binomial Probability Distribution**: To find binomial probabilities select [0:binompdf(]. The inputs are *binompdf(number of trials, probability of success, x)*

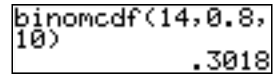
Example 1: To find the probability associated with n = 14, p = 0.8, x = 10 enter the values shown in the first computation to the right and press [ENTER] to get 0.1720.

Example 2: If you have a few probabilities to find with the same n and p you can do them all at the same time. Such as, n = 14, p = 0.8 and x = 8, 9 & 10. Enter the values shown in the second computation to the right where the x values are in a list. Press [ENTER] and you get all three probabilities as a list {.0322 .0860 .1720}.



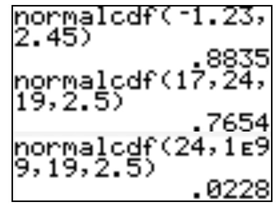
**Binomial Cumulative Density Function**: To find binomial cumulative probabilities select [A:binomcdf(]. The inputs are *binomcdf(number of trials, probability of success, x)* and the result will be the sum of all probabilities less than or equal to x.

Example 3: To find the cumulative probability associated with n = 14, p = 0.8, $x \leq 10$ enter the values shown in the computation to the right and press ENTER to get 0.3018.




**Normal Distributions**: To find probabilities from the normal distribution select [2:normalcdf(]. The inputs are *normalcdf(lower bound, upper bound)* if your dealing with the standard normal distribution or *normalcdf(lower bound, upper bound,* $\mu, \sigma$*)* if you are dealing with a normal distribution

Example 4: To find the area under the normal curve between z = –1.23 and z = 2.45 enter the values shown in the first computation to the right and press ENTER to get 0.8835.




Example 5: To find the area under the curve between 17 and 24 of a normal distribution with $\mu = 19$ and $\sigma = 2.5$ enter the values shown in the second computation to the right and press ENTER to get 0.7654.

Example 6: To find the area to the right of 24 of a normal distribution with $\mu = 19$ and $\sigma = 2.5$ use the fact that 1E99 is essentially $+\infty$ as far as the computation is concerned and enter the values shown in the third computation to the right and press ENTER to get 0.0228.
NOTE: Use –1E99 for $-\infty$ .

Important note: You must keep in mind that the calculator is finding the area under the curve much more accurately than the z-table. The z-table rounds the areas to 4 decimal places while the calculator rounds to 10 decimal places. This could cause your answers to be slightly different than answers from the z-table. In the example 5 we got .7654 to 4 decimal places. If you used the z-table you would get .7653. This is a minor difference but it is something that you need to keep in mind.