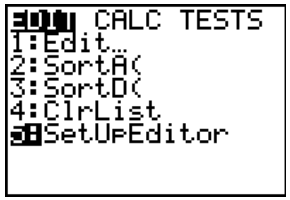
TI-83/84 Statistics Guidelines

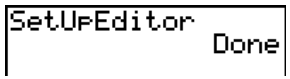
1. **Lists**

   a. **SetUpEditor**

   Press [STAT] **5** to select **5:SetUpEditor**. **SetUpEditor** is pasted to the home screen.



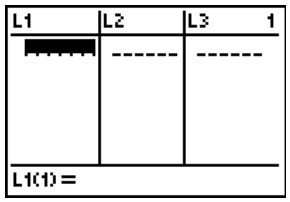
   Press [ENTER]. This removes lists from stat list editor columns **1** through **20**, and then stores lists **L1** through **L6** in columns **1** through **6**.



   Note: Removing lists from the stat list editor does not delete them from memory.

   b. **creating new lists**

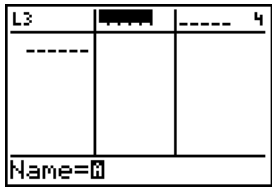
   Press [STAT] **1** to select **1:Edit** from the **STAT EDIT** menu. The stat list editor is displayed. You can then enter in the data values.



   c. **viewing lists**

   You can view a list in the list editor two ways. The first is to use the **SetUpEditor** command. On the main screen, enter **SetUpEditor L1, L2**. (or any other lists you wish to view)

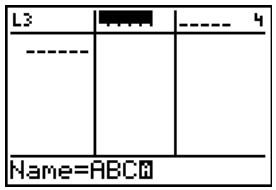
   The second is to manually enter a particular list name. In the STAT EDIT screen, move the cursor over the list names, then arrow to the right until you reach a blank list.



   The **Name=** prompt is displayed and alpha-lock is on.

   Enter a valid list name in any of four ways.

   i. Select a name from the **LIST NAMES** menu.
   ii. Enter **L1**, **L2**, **L3**, **L4**, **L5**, or **L6** from the keyboard.
   iii. Enter an existing user-created list name directly from the keyboard. (Use the letters on the keyboard.)
   iv. Enter a new user-created list name. (pictured)



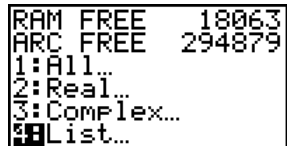
   d. **clearing lists**

   If elements are stored in any list you wish to clear, move the cursor over the list name, then press [CLEAR] [ENTER] to clear the list.

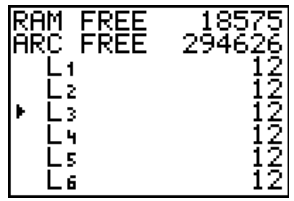
   e. **deleting lists**

   To delete a list permanently from memory,

   i. Press [2nd] [MEM] to display the **MEMORY** menu.
   ii. Select **2:Mem Mgmt/Del** to display the **MEMORY MANAGEMENT/DELETE** menu.

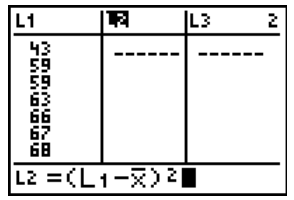


   iii. Select **4:List**, the **LIST** editor screen is displayed.
   iv. Press ▲ and ▼ to move the selection cursor next to the item you want to delete, and then press [DEL]. The list is deleted from memory. You can delete individual lists one by one from this screen.



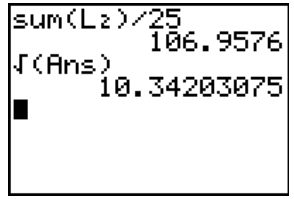
   f. **defining one list in terms of another**

   This is often helpful when filling out a table for the calculation of *s*, *r*, or other statistics. To define one list in terms of another, move the cursor over the list name and press [ENTER]. In the command line, enter the appropriate operations on the list as if it were a value. (In the example, the calculation is for the sample standard deviation – calculating the squared deviation from the sample mean.)



   g. **operations on lists**

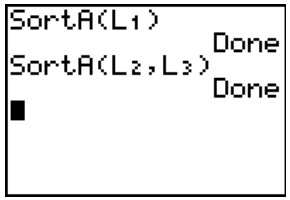
   Press [2nd] [LIST] ▶ ▶ to go to the LIST MATH menu. Continuing with the previous example, the sample variance of **L1** is the sum of **L2** divided by n-1.



   Other operations can be found in the LIST MATH menu.

h. **sorting lists**

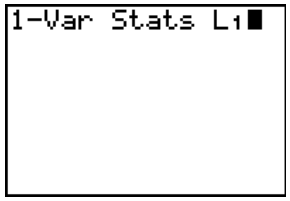
To sort a list, press [STAT] **2:SortA(** or **3:SortD(**, then enter the name of the list on the main screen. To sort bivariate data so corresponding values retain their position, enter **SortA(xList, yList)**. (See screenshot.)



2. **Statistics**

a. **1-Var Stats**

1-Var Stats (one-variable statistics) analyzes data with one measured variable. Each element in *freq* is the frequency of occurrence for each corresponding data point in *Xlist*. *freq* elements must be real numbers greater than zero.

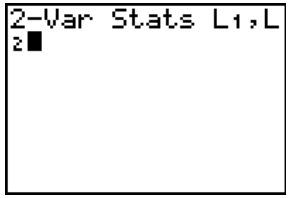


1-Var Stats [*Xlist*,*freq*]

If you just have data in a list, the *freq* is not necessary. (See screenshot.) If you have a frequency table, use the midpoints as the *Xlist* and the frequencies as the *freq*.

b. **2-Var Stats**

2-Var Stats (two-variable statistics) analyzes paired data. *Xlist* is the independent variable. *Ylist* is the dependent variable. Each element in *freq* is the frequency of occurrence for each data pair (*Xlist,Ylist*).



2-Var Stats [*Xlist*,*Ylist*]

Remember to always put your predictor variable as the *Xlist*, and your response variable as the *Ylist*.

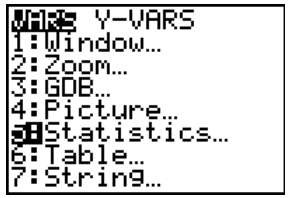
c. **LinReg(ax+b)**

LinReg(ax+b) (linear regression) fits the model equation y=ax+b to the data using a least-squares fit. It displays values for **a** (slope) and **b** (y-intercept); when **DiagnosticOn** is set, it also displays values for $\mathbf{r}^2$ and **r**.

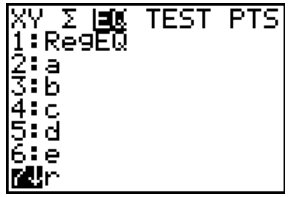
LinReg(ax+b) [*Xlist*,*Ylist*]

d. **variables**

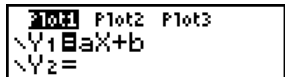
Any variable displayed on your calculator such as $\bar{x}$, $\bar{y}$, s_x, s_y, a, b, r, etc. is stored in the memory after running **1-Var Stats** or **2-Var Stats**. To retrieve the variables from memory, press [VARS] **5** to select **5:Statistics**.



$\bar{x}$, $\bar{y}$, s_x, and s_y are stored under the **XY** menu, while a, b, and r are stored under the **EQ** menu.

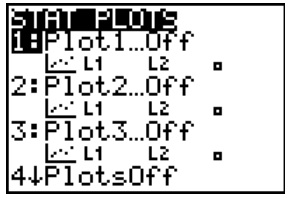


You can use these variables to graph the Least Squares Regression line under the [Y=] menu.



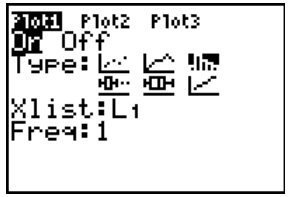
3. **Plots**

To graph statistical plots on your calculator, press [2nd] [STAT PLOT] to go to the **STAT PLOT** menu. Once in this menu, you have three separate plots you can activate. All three can be drawn at once, or each one can be drawn individually. Once in the **STAT PLOT** menu, choose **1**, **2**, or **3** to edit a particular plot.



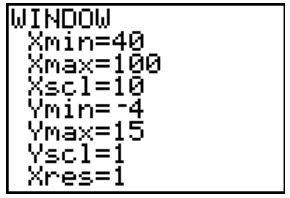
a. **histogram**

To plot a histogram, first turn the plot on and select the histogram icon: . Enter the list you wish to plot as the Xlist.



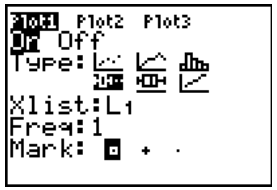
Press [WINDOW] to set up the lowest class limit and class width.

Enter the lowest class limit as Xmin, a value higher than any data value as Xmax, and the class width as Xscl. The Ymin and Ymax deal with frequencies. A good choice for Ymin is -5, and a value larger than the largest frequency for Ymax.

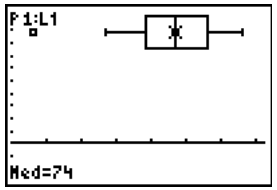


b. **box plot**

To plot a box plot, select the box plot icon: . Enter the list you wish to plot as the Xlist.



Press [ZOOM] **9** to select **9:ZoomStat** to view the box plot in an easily viewable window.

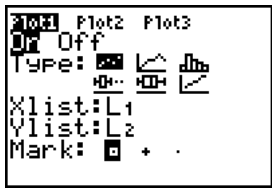


An interesting tool when viewing the box plot is to use the TRACE tool. Press [TRACE] and use the [◄] and [►] buttons to move between the values.

It should be noted that the **Q1** and **Q3** values sometimes are different than those calculated using the rules in some texts.

c. **scatter diagram (LSR line)**

A scatter diagram plots the response variable. vs. the predictor variable. Select the scatter diagram in the STAT PLOT window: . Enter the predictor variable list as Xlist and the response variable list as Ylist.

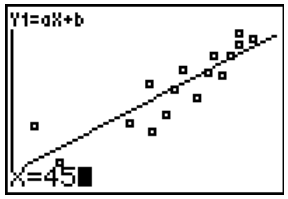


4. **Miscellaneous topics**

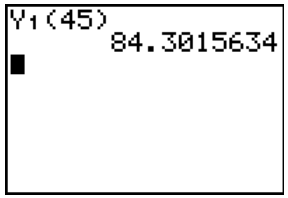
a. **calculating predicted values**

There are two good ways to calculate predicted variables from the LSR line. (or any other line) Both require that the LSR line is entered under **Y1** in the [Y=] menu. (See 2d: variables.)

i. In the [GRAPH] window, press [TRACE]. Initially, the cursor will be on the stat plot. Press [▲] or [▼] to switch to the LSR line. Once you are tracing the LSR line, type in the predictor value and press [ENTER]. The predicted value will be shown as **Y**.



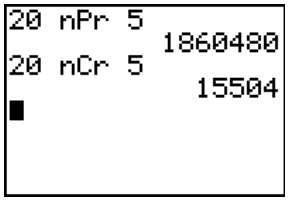
ii. On the main screen, press [VARS] [►] to go to the Y-VARS menu. Press [ENTER] to select **1:Function**, and [ENTER] again to select **Y1**. Use function notation (shown) to evaluate **Y1** at a value.



5. **Probability**

a. **permutations and combinations**

Press [MATH] [◄] to enter the PRB menu. select **2:nPr** to perform a permutation or **3:nCr** for a combination. (See screenshot for syntax.)

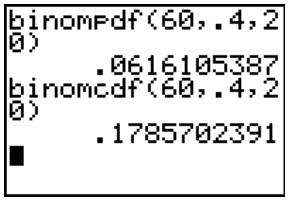


b. **binomial probability**

i. P(X = x)

To calculate binomial probabilities, press [2nd] [DISTR] to access the distributions menu. **0:binompdf(** calculates the probability for a particular value.

binompdf(*n*, *p*, *x*)



ii. P(X ≤ x)

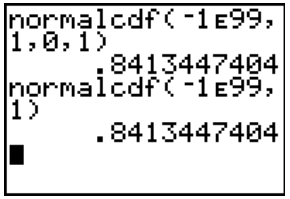
[Access the same menu as 5.b.i.] Select **A:binomcdf(** to calculate the cumulative binomial probability.

binomcdf(*n*, *p*, *x*)

c. **normal probability**

i. To calculate normal probabilities, press [2nd] [DISTR] to access the distributions menu. **2:normalcdf(** calculates the area under the normal probability density function.

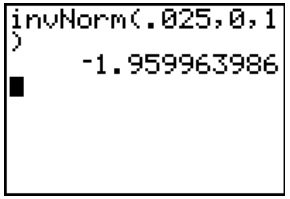
normalcdf(*start*, *end*, *μ*, *σ*)
(note: By default μ = 0 and σ = 1.)



Also note that **-1E99** and **1E99** are used in place of -∞ and ∞. Press [2nd] [EE] to imply x10^?.

ii. To find Z or X given the area to the left of Z or X, press [2nd] [DISTR] to access the distributions menu. **3:invNorm(** returns the Z or X with the given area to the left.

invNorm(*area*, *μ*, *σ*)



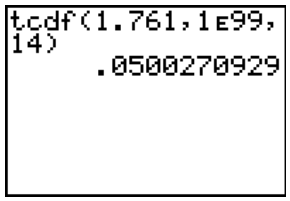
d. ***t* probability**

Calculating probabilities from the *t*-distribution is similar to calculating normal probabilities.

Press 2nd [DISTR] to access the distributions menu. **5:tcdf(** calculates the area under the *t* probability density function.

tcdf(*start*, *end*, *degrees of freedom*)

-1E99 and **1E99** are again used in place of -∞ and ∞. Press 2nd [EE] to imply x10^?.

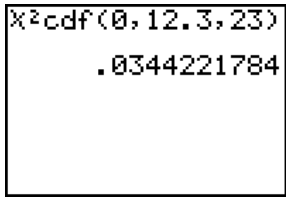


e. **χ^2 probability**

Calculating probabilities from the χ^2 distribution is similar to calculating other probabilities.

Press 2nd [DISTR] to access the distributions menu. **7:χ^2cdf(** calculates the area under the χ^2 probability density function.

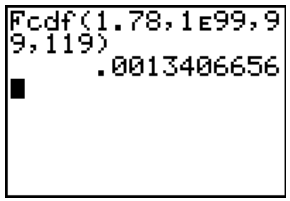
χ^2cdf(*start*, *end*, *degrees of freedom*)



f. ***F* probability**

Press 2nd [DISTR] to access the distributions menu. **9:Fcdf(** calculates the area under the F probability density function.

Fcdf(*start*, *end, numerator d.f., denominator d.f.*)



6. **Normal probability plots**

[See 3. Plots for information on statistical plots.]

To plot a normal probability plot, first turn the plot on and select the normal probability plot icon: ⌞. Enter the list you wish to plot as the Data List.

Press ZOOM **9** to select **9:ZoomStat** to view the plot in an easily viewable window.