# Calculator Tutorial for Chapter 1

☺ **Input data**

Step 1: Press **STAT**. Go to **EDIT**.

Step 2: Highlight first option, **Edit**, then press **ENTER**.

Step 3: Input your data on list 1 (L1)

☺ **Find five-number summary, mean and std.**

Step 1: Press **STAT**. Go to **CALC**.

Step 2: Highlight first option, **1-Vat Stats**, then press **ENTER**.

Step 3: Press **2ND** and **1** (to use list L1), then press **ENTER**.

Step 4: Scroll sown.

☺ **Make a boxplot**

Step 1: Press **2ND** and **Y=**, and then press **ENTER**.

Step 2: Highlight **On** and press **ENTER**. Then highlight the first boxplot icon and press **ENTER**.

Step 3: Press **ZOOM**. Go to **9** and press **ENTER**.

Step 4: If you press **TRACE**, you should be able to see the values of five-number summary.

Note. The above instructions are for the type of boxplot that enforces the 1.5 IQR rule. If you want a "regular" boxplot, simply highlight the second boxplot icon on your menu and follow the same steps.

☺ **Make a histogram**

Step 1: Press **2ND** and **Y=**, and then press **ENTER**.

Step 2: Highlight **On** and press **ENTER**. Then highlight the histogram icon and press **ENTER**.

Step 3: Press **ZOOM**. Go to **9** and press **ENTER**.

Step 4: If you press **TRACE**, you should be able to see min and max for each subinterval and also the frequency.

Step 5: If you want to change the bin width, press **WINDOW**. Manually input Xmin, Xmax and Xscal.

$$bin\ width = \frac{Xmax - Xmin}{\#\ of\ bins}$$

☺ **Graph a normal distribution density curve.**

#1: normalpdf

pdf = Probability Density Function

This function returns the probability of a single value of the random variable x. Use this to graph a normal curve. Using this function returns the ycoordinates of the normal curve.

Step 1: Press **2ND** and **Y=**, and then press **ENTER**. Go to **$Y_1$=**.

Step 2: Press **2ND** and **VARS**, and then press **ENTER**.

Step 3: Highlight **normalpdf(** and press **ENTER**.

Step 4: Press **XT$\theta$n** and **","**. Then input mean and std.

Syntax: normalpdf (X, mean, standard deviation)

Step 5: Press **ZOOM**. Go to **0** and press **ENTER**.

☺ **Calculate probability (Finding an area under the normal density curve)**

#2: normalcdf

cdf = Cumulative Distribution Function

This function returns the cumulative probability from zero up to some input value of the random variable x. Technically, it returns the percentage of area under a continuous distribution curve from negative infinity to the x. You can, however, set the lower bound as **1 EE 99**. Enter then EE by pressing **2ND** and ",". Only one E will show on the screen.

Step 1: Press **2ND** and **VARS**, and then press **ENTER**.

Step2: Highlight **normalcdf(** and press **ENTER**.

Syntax: normalcdf (lower bound, upper bound, mean, standard deviation)

Example: normalcdf(lowerbound, upperbound, mean, std)

normalcdf(-1 EE 99, upperbound, mean, std)

normalcdf(lowerbound, 1 EE 99, mean, std)

☺ **Show an area under the curve.**

#3: ShadeNorm

The area under the density curve between particular values represents the probability of events occurring within that specific range.

Step 1: Press **2ND** and **VARS**, and then press **ENTER**.

Step 2: Go to **DRAW** and press **ENTER**.

Step 3:Highlight **ShadeNorm(** and press **ENTER**.

Syntax: ShadeNorm (lower bound, upperbound, mean, standard deviation)

Note. Before attempting ShadeNorm, be sure that Y1 = normalpdf(x, mean, standard deviation) is active.

☺ **Given a probability region to the left of a value (i.e., a percentile), determine the value.**

#4: invNorm(

inv = Inverse Normal Probability Distribution Function.

This function returns the xvalue given the probability region to the left of the xvalue. (0 < area < 1 must be true.) The inverse normal probability distribution function will find the precise value at a given percent based upon the mean and standard deviation.

Step 1: Press **2ND** and **VARS**, and then press **ENTER**.

Step2: Highlight **invNorm(** and press **ENTER**.

Syntax: invNorm (probability, mean, standard deviation)