How to use Calculator to help you find Standard Deviation of a Probability Distribution

(Section 4.1 – Practice with Example 3 from Lecture Notes)

- You are given a Probability Distribution chart (x and P(x))

Now in the calculator…

STAT – **ENTER** (to select 1:Edit)

In **L_1** (List 1), enter the Data list "x". (Type a data value, then ENTER, the next data value, then ENTER…)

2nd – QUIT (This gets you back to the 'Main' screen)

STAT – **ENTER** (to select 1:Edit)

⇒ (Right arrow over to the next free column – should be List 2) , then ⇑ (to be on top of the list)

2ND – 1 (This types in L_1 for where your data is listed) then **MINUS (-)** YOUR mean value, then **ENTER**

(This will auto fill the L_2 with your Deviations)

⇒ (Right arrow over to the next column) , then ⇑ (to be on top of the list)

2ND – 2 (This types in L_2 for where your newest data is listed) -- x^2 -- **ENTER**

(This will auto fill the L_3 with your Squares of Deviations)

⇒ (Right arrow over to the next column) , then ⇑ (to be on top of the list)

In **L_4** (List 4), enter the Data list "P(x)". (Type a data value, then ENTER, the next data value, ENTER…)

⇒ (Right arrow over to the next column) , then ⇑ (to be on top of the list)

2ND – 3 (This types in L_5 for where your squared deviation data is listed) -- **times – 2ND – 4** (This types in L_4 for where your P(x) data is listed) -- **ENTER**

(This will auto fill the L_5 with your Squares of Deviations times Probability of X)

2nd – QUIT (This gets you back to the 'Main' screen)

STAT -- ⇒ (To get to CALC) – **1** (To select 1:1-VarStats)

2ND – 5 (This types in L_5 for where your last bit of data is listed)

Then hit **ENTER** or scroll down to blink on Calculate then hit **ENTER** (This step depends on your calculator type)

Look for $\Sigma x=$ (This value will be your Sum of Squares times Probability) = This is your Variance!

Taking the square root of your result for Variance will equal your Standard Deviation!

Formula for the Probability Distributions:

Variance = $\sigma^2 = \sum(x-\mu)^2 P(x)$

Standard Deviation = $\sigma = \sqrt{\sum(x-\mu)^2 P(x)}$