

# TI-83/83 Plus: Confidence Interval for One-Sample Mean with $\sigma$ Unknown

The following pages contain some instructions on the usage of the TI-83/83 Plus graphing calculator.

The example used below is taken out of David Moore's text titled "The Basic Practice of Statistics, 2<sup>nd</sup> Edition".

Example#7.1 Cockroach metabolism p. 370: To study the metabolism of insects, researchers fed cockroaches measured amounts of a sugar solution. After 2, 5, and 10 hours, they dissected some of the cockroaches and measured the amount of sugar in various tissues. Five roaches fed the sugar D-glucose and dissected after 10 hours had the following amounts (in micrograms) of sugar D-glucose in their hindguts:

55.95                  68.24                  52.73                  21.50                  23.78

The researchers would like to give a 95% confidence interval for the mean amount of D-glucose in cockroach hindguts under these conditions.

To enter the D-glucose data set press **[STAT]**. Press **[ENTER]** to select **1:Edit** from the STAT EDIT menu. Press **[↑]** to move the cursor to the top line where the list names are located and then press **[→]** until you reach the unnamed column. The cursor is in alpha mode as it is indicated by the highlighted capital A in the upper right hand corner of your display. Type in the name DGLUC short for the amount of D-glucose. Press **[ENTER]** to store the list name. Press **[↓]** to begin entering the data set. Start typing in the concentration values from the data set, pressing **[ENTER]** after each data point. When you have finished entering the last concentration, your screen should look like the screen on the left given below.

GAS	CONS	DGLUC 14
6.3	.8403	55.95
10.9	.8363	68.24
8.9	.8447	52.73
7.5	-----	21.5
5.3		23.78
4		██████
1.7		

DGLUC(6) =

EDIT CALC	TESTS
2:T-Test...	
3:2-SampZTest...	
4:2-SampTTest...	
5:1-PropZTest...	
6:2-PropZTest...	
7:ZInterval...	
8:TInterval...	

TInterval
Inpt:Data <b>DATA</b>
$\bar{x}$ :126.07
Sx: .0042015870...
n:72
C-Level: .95
Calculate

Press **[STAT]**. Press **[→]** two times to scroll right to the TESTS menu option. Press **[↓]** seven times to move the cursor down to **8:TInterval**, which stands for one-sample t confidence interval with  $\sigma$  unknown. At this point, your screen should look like the screen in the middle given above.

Press **[ENTER]** to select **8:TInterval** and go into the STAT TESTS menu screen. At this point, your screen should look like the screen on the right given above with the cursor blinking over either the **Data** or **Stats** input options. You may possibly have different numbers. Scroll over to the **Data** input option and press **[ENTER]** to select that option. Press **[↓]** to scroll down to **List:** The list name DGLUC, which had been already stored, must be assigned to **List:** Press **[2nd]** and **[STAT]** to access the LIST menu. Press **[↓]** till you move the cursor by the name DGLUC and press **[ENTER]** to paste the name by **List:** Press **[↓]** to

move the cursor down to **Freq:**, which is left at the default value of 1. Press  $\downarrow$  to move the cursor down to **C-Level:** Type in 0.95 for computing a 95% confidence interval for the mean amount of D-glucose in cockroach hindguts. Press  $\downarrow$  to move the cursor down to **Calculate** option. At this point, your screen should look like the screen on the left given below with the cursor blinking over the **Calculate** option.

```
TInterval
Inet:0.95 Stats
List: DGLUC
Freq: 1
C-Level: .95
Calculate
```

```
TInterval
(18.687,70.193)
 $\bar{x}$ =44.44
Sx=20.74080158
n=5
```

Press  $\text{ENTER}$  to select the **Calculate** option. Your calculated result screen should look like the screen on the right given above.

In addition to the confidence interval, the calculator will have computed the sample mean,  $\bar{x}$ , and sample standard deviation,  $s$ , and will display them along with the sample size  $n$ .

The interpretation of the above computed confidence interval in the context of the problem can be stated as follows. We are 95% confident that the mean amount of D-glucose in cockroach hindguts lies between 18.687 and 70.193 micrograms.