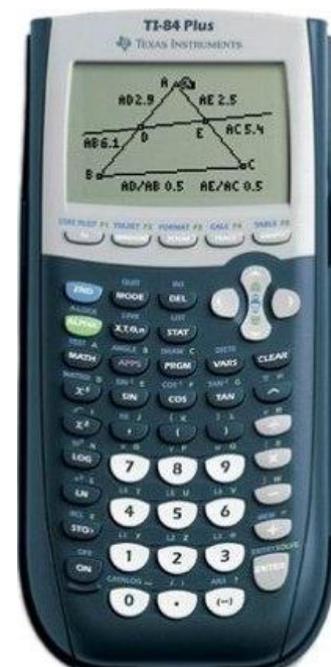


How to Use the TI 83/84 for Stats

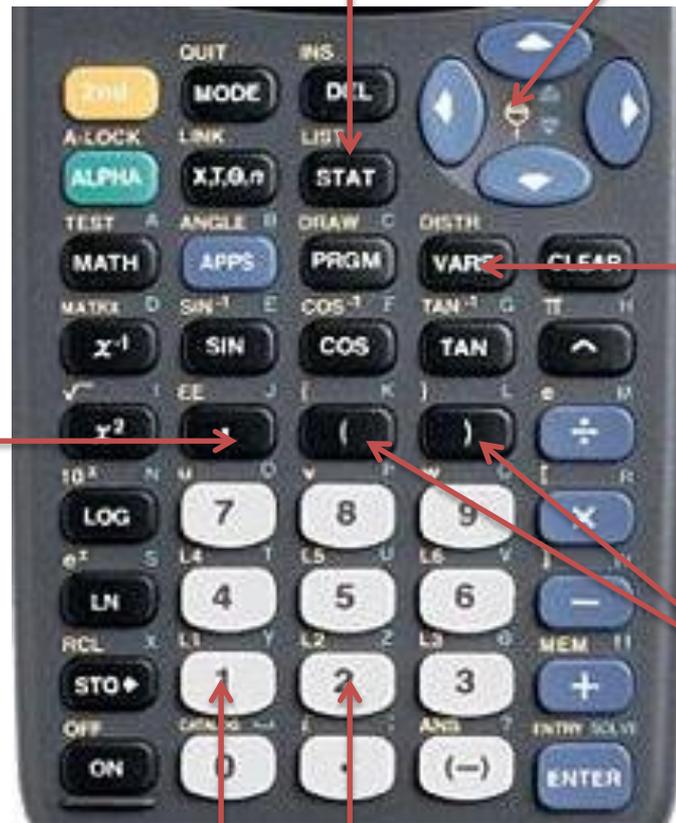
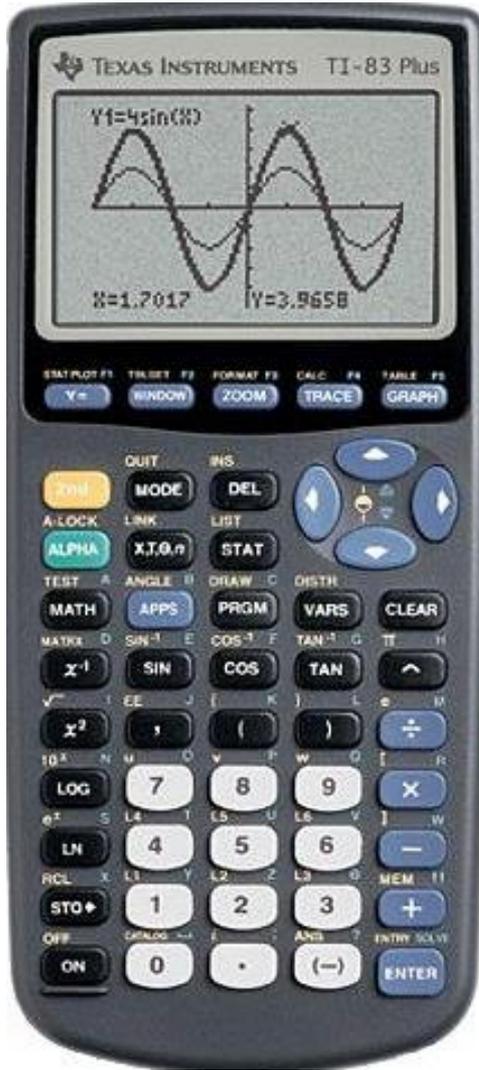


Mary Stangler
Center for Academic Success

A Few Notes

- The pictures go left to right (not all steps have pictures)
- Your calculator's screen might look a little different than the pictures

Stats Important keys

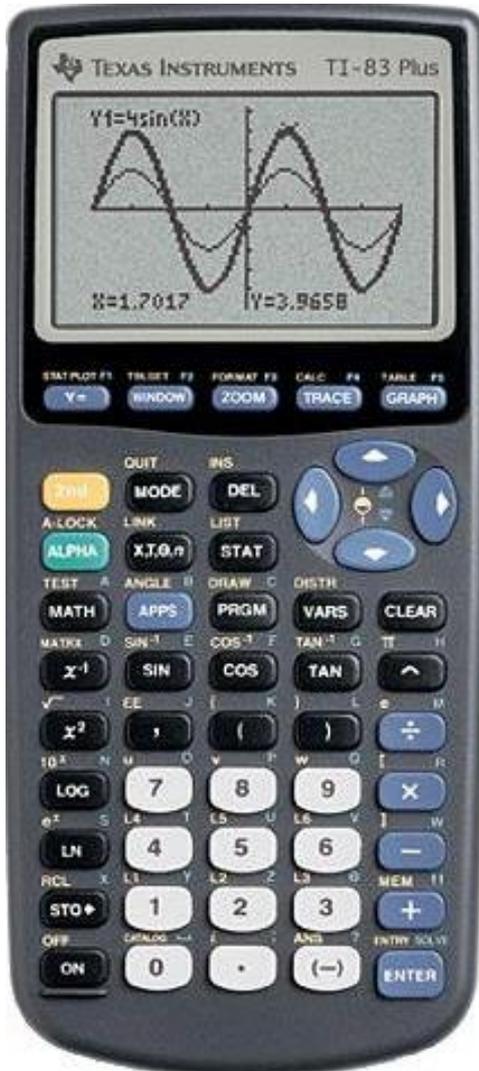


Options in *italics* means you need to press the 2nd key first

L1

L2

Plotting Points Important keys



Y=
STATPLOT

WINDOW

ZOOM

GRAPH



Options in *italics* means you need to press the 2nd key first

STAT

Arrow Keys

Making Graphs

You can make scatter plots, box plots, and histograms following these steps

1. Press STAT
2. Press Enter
3. Type in x values in L1 and y values in L2. Press Enter after each value. Use the left and right arrow keys to move between the lists.
4. Press 2nd y= (STATPLOT)
5. Press Enter
6. Make sure the cursor (flashing) is over the on, then press enter.
7. Press the down arrow
8. Move the cursor so it is on the kind of graph you want and press enter
9. Press Graph

Note: Use 2nd Mode (QUIT) to Exit out of the Lists

```

EDIT1 CALC TESTS
1:Edit
2:SortA(
3:SortD(
4:ClrList
5:SetUPEditor
    
```

L1	L2	L3	1
1	2	3	4
5	6	7	8

L1(1) =

L1	L2	L3	2
1	2	3	4
5	6	7	8

L2(4) =

```

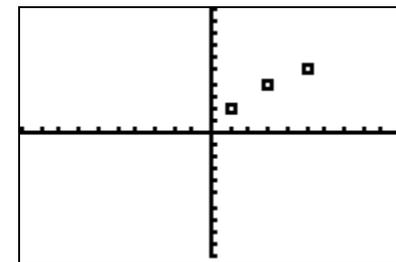
STAT PLOTS
1:Plot1...Off
  L1 L2
2:Plot2...Off
  L1 L2
3:Plot3...Off
  L1 L2
4:PlotsOff
    
```

```

Plot1 Plot2 Plot3
On Off Off
Type: [Scatter] [Box] [Histogram]
Xlist:L1
Ylist:L2
Mark: [Square] + .
    
```

```

Plot1 Plot2 Plot3
Off Off Off
Type: [Scatter] [Box] [Histogram]
Xlist:L1
Ylist:L2
Mark: [Square] + .
    
```



Adjusting the Window for Stats

If you cannot see the graph, you might need to adjust the window.

1. Press ZOOM
2. Scroll down to ZoomStat (number 9) and press enter

Your graph should now appear

```
MEMORY
1: ZBox
2: Zoom In
3: Zoom Out
4: ZDecimal
5: ZSquare
6: ZStandard
7↓ ZTrig
```

```
MEMORY
3↑ Zoom Out
4: ZDecimal
5: ZSquare
6: ZStandard
7: ZTrig
8: ZInteger
9↑ ZoomStat
```

Important Numbers: One Variable

We can find the minimum, maximum, median, quartiles, standard deviation, and mean all in the same place.

1. Press STAT
2. Press Enter
3. Enter the data into L1. Press enter after each number
4. Press STAT
5. Go over (with the arrow) to Calc
6. Press enter (or hit number 1) for 1-var stats
7. Press Enter again
8. The important numbers appear. To see more, scroll down with the down arrow.

For details on what everything means in 1-var stats, see next page.

```
EDIT | CALC TESTS
1: Edit...
2: SortA(
3: SortD(
4: ClrList
5: SetUpEditor
```

L1	L2	L3	1
-----	-----	-----	
L1(?) =			

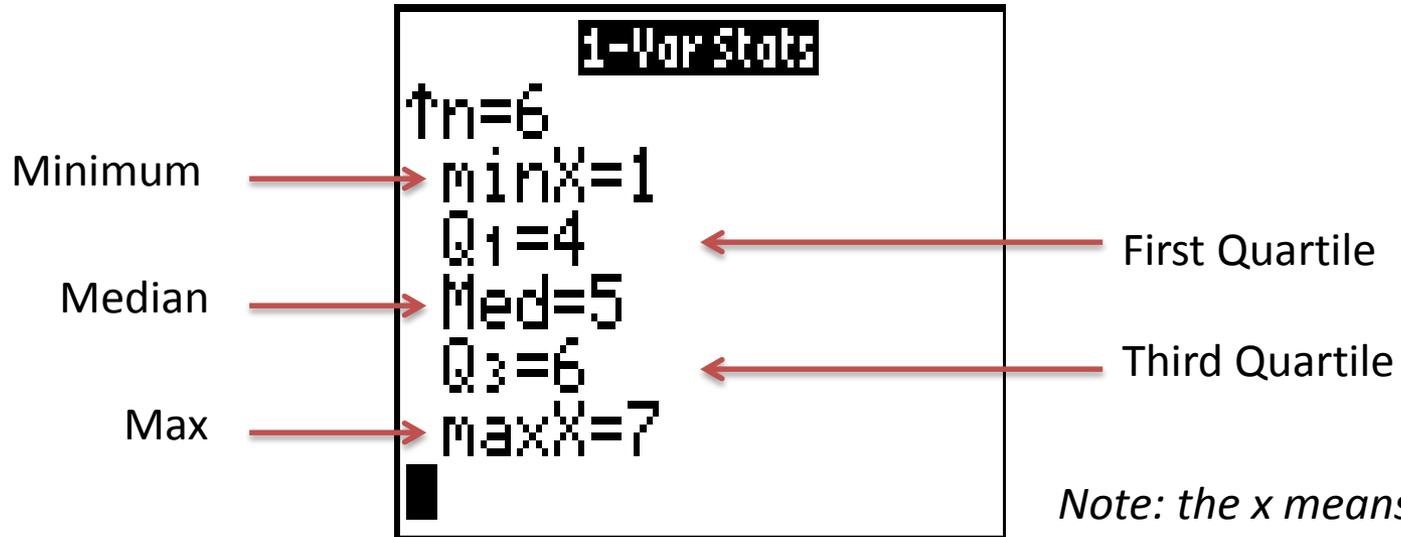
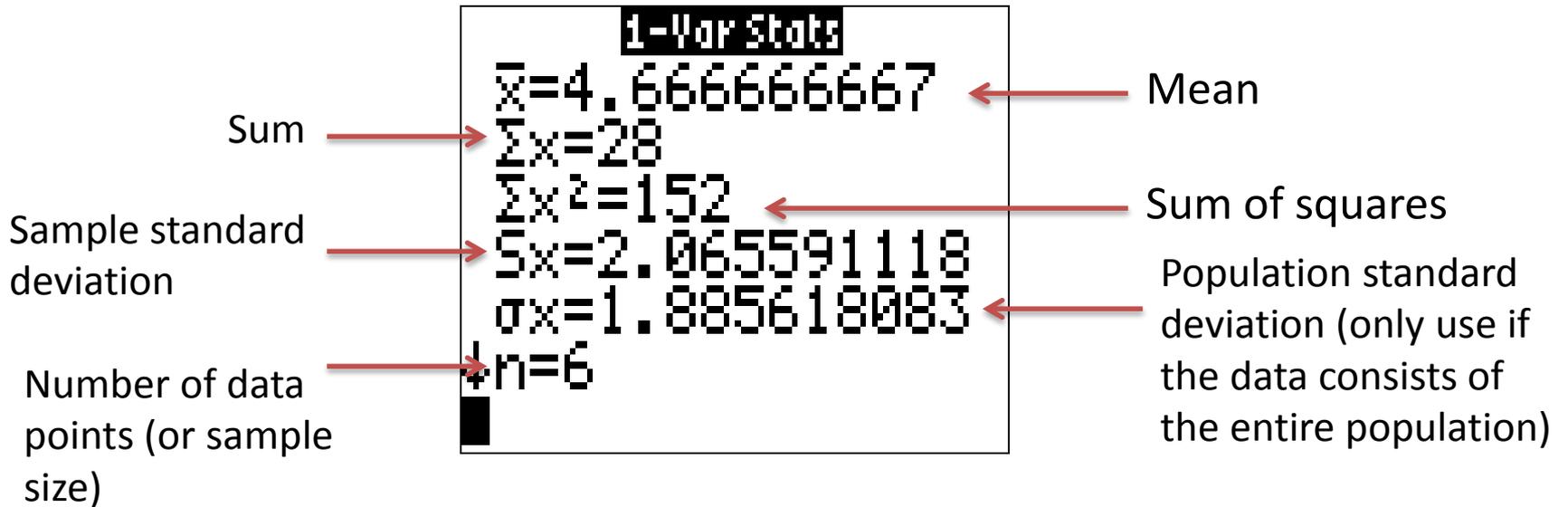
L1	L2	L3	1
-----	-----	-----	
L1(?) =			

```
EDIT | CALC TESTS
1: 1-Var Stats
2: 2-Var Stats
3: Med-Med
4: LinReg(ax+b)
5: QuadReg
6: CubicReg
7: QuartReg
```

```
1-Var Stats █
```

```
1-Var Stats
x̄=4.666666667
Mx=28
Σx²=152
Sx=2.065591118
σx=1.885618083
↓n=6
█
```

1-Var Stats continued



Note: the x means it is for the x variable)

Important Numbers: Two Variables

1. Press STAT
2. Press Enter
3. Type in x values in L1 and y values in L2.
Press Enter after each value. Use the left and right arrow keys to move between the lists.
4. Press Stat
5. Go over to Calc
6. Scroll down to number 2 and press enter (or press 2)
7. Type 2nd 1 (L1), then comma, 2nd 2 (L2)
8. Press enter

*Some important numbers are then shown
The x indicates the information is for the x variable and the y indicates the information is for the y variable*

```

EDIT  CALC TESTS
1:Edit...
2:SortA(
3:SortD(
4:ClrList
5:SetUPEditor
    
```

L1	L2	L3	1
-----	-----	-----	
L1(1) =			

L1	L2	L3	2
1	2	-----	
-----	-----		
L2(4) =			

```

EDIT  CALC TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7:QuartReg
    
```

```

2-Var Stats L1,L2
2
    
```

```

2-Var Stats
n=3
Mx=9
Mx^2=35
Sx=2
σx=1.632993162
↓n=3
    
```

Before You Can Find Correlation

In order to do correlation, there is a few steps that must be competed prior to finding the correlation. Luckily, you only need to do these steps once (unless you reset your calculator).

1. Press 2nd then 0. This opens the catalog.
2. Press the x^{-1} button (this will jump down to D)
3. Scroll down to DiagnosticON
4. Press Enter
5. Press Enter again (afterwards it should say done)
6. Press clear

```
CATALOG [A]  
▶abs(   
  and   
  angle(   
  ANOVA(   
  Ans   
  Archive   
  Asm(
```

```
CATALOG [A]  
▶dayOfWk(   
  dbd(   
  DEC Answer   
  ▶Dec   
  Degree   
  DelVar   
  DefendAsk
```

```
CATALOG [A]  
  DelVar   
  DefendAsk   
  DefendAuto   
  det(   
  DiagnosticOff   
  ▶DiagnosticOn   
  dim(
```

```
DiagnosticOn■
```

```
DiagnosticOn Done
```

Line of Best Fit and Correlation

Find the line of best fit (aka the least squares regression line)
and the correlation are found together.

1. Enter the points into the list
2. Press STAT.
3. Press the right arrow key to Calc.
4. Select LinReg (#4) and press enter
5. Press Enter again

*Instead of using #4, you can use #8 (the
difference is in the labels)*

*If you do not see r and r^2 , then repeat the
previous slide.*

```
EDIT [2nd][DEL] TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7↓QuartReg
```

```
LinReg(ax+b)
```

```
LinReg
y=ax+b
a=.75
b=1.416666667
r2=.9642857143
r=.9819805061
```

Plotting the Points and Graphing the Line of Best Fit

1. Press STAT.
 2. Press the right arrow key to Calc.
 3. Select LinReg (#4) and press enter
 4. Type 2nd 1 (L1), then comma, 2nd 2 (L2), then comma
 5. The Press VARS
Using the right arrow, move over to Y-vars, then press enter
1. Press enter again
 2. Press enter again
 3. Then press graph.

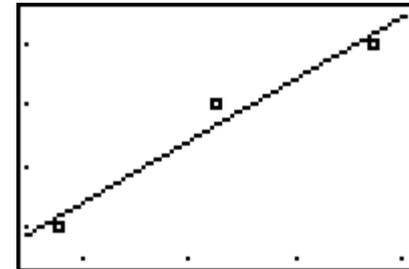
```
LinReg(ax+b) L1,
L2,
```

```
VARs Y-VARS
1:Function...
2:Parametric...
3:Polar...
4:On/Off...
```

```
FUNCTION
1:Y1
2:Y2
3:Y3
4:Y4
5:Y5
6:Y6
7:Y7
```

```
LinReg(ax+b) L1,
L2, Y1
```

```
LinReg
y=ax+b
a=.75
b=1.416666667
r2=.9642857143
r=.9819805061
```



Before you make more graphs you need to clear the line by pressing $y=$, then clearing the equation of the line

Clearing a List

1. Press STAT
 2. Press ENTER
 3. Use the up arrow until the list name is dark
 4. Press Clear (never delete)
 5. Press Enter
- The list is now clear!

L1	L2	L3	2
1 5 5	2 5 5	-----	
L2(4) =			

L1	L2	L3	2
1 5 5	2 5 5	-----	
L2 = {2, 4, 5}			

L1	L2	L3	2
1 5 5	2 5 5	-----	
L2 = █			

L1	L2	L3	2
1 5 5	████████	-----	
L2(1)=			

If you press delete, you must reset your calculator

Random Numbers

Using random numbers is helpful when doing sampling

1. Press Math
2. Go over to PRB
3. Scroll down to RandInt(and press enter
4. Type the smallest possible number
5. Type in a comma
6. Type in the largest number
7. Close parenthesis (not needed but it wont hurt to add it)
8. Press enter, the first random number appears

Keep pressing enter to get more random numbers.

```
MATH NUM CPX PRB
1: ▸Frac
2: ▸Dec
3:
4: √(
5: *√
6: fMin(
7: ↓fMax(
```

```
MATH NUM CPX PRB
1: rand
2: nPr
3: nCr
4: !
5: randInt(
6: randNorm(
7: ↓randBin(
```

```
randInt(001,100)
█
```

```
randInt(001,100)
95
```

Normal Distribution

To find the probability of x being greater or less than something, given a normal distribution

1. Press 2nd then VARS
 2. Select normalcdf(and press enter
- Continues on next slide

```
0: DRAW  
1: normalPdf(  
2: normalcdf(  
3: invNorm(  
4: invT(  
5: tPdf(  
6: tcdf(  
7:  $\chi^2$ Pdf(  

```

Normal Distribution continued

P(x<number)	P(x>number)	P(number<x<number)
<ol style="list-style-type: none"> 3. Type in 1 E -99 (E is done by pressing 2nd then the comma and it means times 10 the) 4. Type in a comma 5.Type the number 6. Type in a comma 7. Type in the mean 8. Type in a comma 9. Type in the standard deviation 10. Enter a parenthesis 11. Press Enter 	<ol style="list-style-type: none"> 3. Type in the number 4. Type in a comma 5.Type the 1 E 99 (E is done by pressing 2nd then the comma and it means times 10 the) 6. Type in a comma 7. Type in the mean 8. Type in a comma 9. Type in the standard deviation 10. Enter a parenthesis 11. Press Enter 	<ol style="list-style-type: none"> 3. Type in the first number 4. Type in a comma 5.Type the second number 6. Type in a comma 7. Type in the mean 8. Type in a comma 9. Type in the standard deviation 10. Enter a parenthesis 11. Press Enter

```
normalcdf(1E-99,
35,36,5)
.4207403122
```

```
normalcdf(35,1E9
9,36,5)
.5792596878
```

```
normalcdf(25,40,
36,5)
.7742412674
```

Finding the Z statistic given a probability

1. Press 2nd Vars
2. Scroll down to `invNorm(` and press enter
3. Type in the probability
4. Press enter

This is the critical z value

```
0:LIST DRAW
1:normalpdf(
2:normalcdf(
3:invNorm(
4:invT(
5:tpdf(
6:tcdf(
7:χ²pdf(
```

```
invNorm(█
```

```
invNorm(.96
```

```
invNorm(.96
1.750686071
```


Binomial Distribution:

$P(x > \text{number})$ and $P(x \geq \text{number})$

Binomcdf(is used when we want $P(x > \text{number})$, $P(x < \text{number})$, $P(x \geq \text{number})$, or $P(x \neq \text{number})$ given a binomial distribution with number of trials n and probability p

$P(x > \text{number})$	$P(x \geq \text{number})$
<ol style="list-style-type: none">1. Type in 1-2. Press 2nd then Vars3. Scroll down to Letter B: binomcdf and press enter4. Type in n5. Type in a comma6. Type in p7. Type in a comma8. Type in the number9. Type in a close parenthesis10. Enter	<ol style="list-style-type: none">1. Type in 1-2. Press 2nd then Vars3. Scroll down to Letter B: binomicdf and press enter4. Type in n5. Type in a comma6. Type in p7. Type in a comma8. Type in the number-19. Type in a close parenthesis10. Enter

```
1-binomcdf(15,.2  
,3)  
      .3518378953
```

```
1-binomcdf(15,.2  
,3-1)  
      .6019767884
```

Binomial Distribution:

$P(x < \text{number})$ and $P(x \div \text{number})$

Binomcdf(is used when we want $P(x > \text{number})$, $P(x < \text{number})$, $P(x \geq \text{number})$, or $P(x \div \text{number})$ given a binomial distribution with number of trials n and probability p

$P(x < \text{number})$	$P(x \div \text{number})$
<ol style="list-style-type: none">1. Press 2nd then Vars2. Scroll down to Letter B: binomcdf and press enter3. Type in n4. Type in a comma5. Type in p6. Type in a comma7. Type in the number-18. Type in a close parenthesis9. Enter	<ol style="list-style-type: none">1. Press 2nd then Vars2. Scroll down to Letter B: binomcdf and press enter3. Type in n4. Type in a comma5. Type in p6. Type in a comma7. Type in the number8. Type in a close parenthesis9. Enter

```
binomcdf(15,.2,3  
-1)  
      .3980232116
```

```
binomcdf(15,.2,3  
)  
      .6481621047
```


T-distribution continued

$H_a: \tilde{\mu} < \text{number}$	$H_a: \tilde{\mu} > \text{number}$	$H_a: \tilde{\mu} \neq \text{number}$
<ol style="list-style-type: none"> 3. Type in 1 E -99 4. Type in a comma 5. Type the t statistic 6. Type in a comma 7. Type in the degrees of freedom 8. Enter a parenthesis 9. Press Enter 	<ol style="list-style-type: none"> 3. Type in the t statistic 4. Type in a comma 5. Type the 1 E 99 6. Type in a comma 7. Type in the degrees of freedom 8. Enter a parenthesis 9. Press Enter 	<ol style="list-style-type: none"> 3. Type in the t statistic 4. Type in a comma 5. Type the 1 E 99 6. Type in a comma 7. Type in the degrees of freedom 8. Enter a parenthesis 9. Press Enter 10. Times by 2

```
tcdf(1E-99,3.2,7
6)
.4989970521
■
```

```
tcdf(3.2,1E99,76
)
.0010029479
```

```
tcdf(3.2,1E99,76
)
.0010029479
Ans*2
.0020058959
■
```

Confidence Intervals Option 1: Data

Use this option when you have a list of data

1. Enter your data into L1 (and L2 if needed)
2. Press Stat
3. Go over to tests
4. Scroll down and select the type of interval you want (they start at 7)
For this example we will use Tinterval
4. Go over to data and hit enter (if data is already selected skip this step)
5. Scroll down
6. Where it says List: it should say L1 (like the picture).
If your data is not in L1, switch it now
7. Scroll down and Leave Freq:1 alone
8. Scroll down and For C-level: type in your confidence interval (as a decimal)
9. Scroll down to calculate and press enter to get your confidence interval

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

```

```
EDIT CALC TESTS
3:2-SampZTest...
4:2-SampTTest...
5:1-PropZTest...
6:2-PropZTest...
7:ZInterval...
8:TInterval...
9:2-SampZInt...

```

```
TInterval
Inpt:DATA Stats
List:L1
Freq:1
C-Level:.95
Calculate

```

```
TInterval
(-1.968, 7.9683)
x=3
sx=2
n=3

```

Confidence Intervals Option 2: Stats

Use this option when you have the mean, standard deviation, etc.

1. Press Stat
2. Go over to tests
3. Scroll down and select the type of interval you want (they start at 7)
For this example we will use Tinterval
4. Go over to stats and hit enter (if stats is already selected skip this step)
5. Scroll down and Type in the mean
6. Scroll down and type in the standard deviation
7. Scroll down and type in the sample size
8. Scroll down and For C-level: type in your confidence interval (as a decimal)
9. Scroll down to calculate and press enter to get your confidence interval

```
EDIT CALC TESTS
1:Z-Test...
2:T-Test...
3:2-SampZTest...
4:2-SampTTest...
5:1-PropZTest...
6:2-PropZTest...
7↓ZInterval...
```

```
EDIT CALC TESTS
3↑2-SampZTest...
4:2-SampTTest...
5:1-PropZTest...
6:2-PropZTest...
7:ZInterval...
8↓TInterval...
9↑2-SampZInt...
```

```
TInterval
Inpt:Data
x̄=3
Sx=2
n=3
C-Level: .95
Calculate
```

```
TInterval
(-1.968, 7.9683)
x̄=3
Sx=2
n=3
```

Hypothesis Testing Option 1: Data

Use this option when you have a list of data

1. Enter your data into L1 (and L2 if needed)
2. Press Stat
3. Go over to tests
4. Scroll down until you see the test you want and hit enter

For this example we will use 2-sampleTTest

4. Go over to data and hit enter (if data is already selected skip this step)
5. Scroll down and make any changes needed (for example you have your data in different lists)
6. Scroll down to μ_1 : and select your alternative hypothesis and press enter
7. Scroll down and change pooled to yes or no as needed (by pressing enter)
8. Scroll down to calculate and press enter

The t is the test statistic, and p is the p -value you need to make your decision about your hypothesis are given.

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

```
2-SampTTest
Inpt: DATA Stats
List1:L1
List2:L2
Freq1:1
Freq2:1
 $\mu_1$ :  $\neq \mu_2$  <  $\mu_2$  >  $\mu_2$ 
Pooled: Yes
```

```
2-SampTTest
List1:L1
List2:L2
Freq1:1
Freq2:1
 $\mu_1$ :  $\neq \mu_2$  <  $\mu_2$  >  $\mu_2$ 
Pooled: Yes
Calculate Draw
```

```
2-SampTTest
 $\mu_1$  <  $\mu_2$ 
t = -.4588314677
P = .3358686277
df = 3.740932642
 $\bar{x}_1$  = 3
 $\bar{x}_2$  = 3.666666667
```

Hypothesis Testing Option 2: Stats

Use this option when you have the mean, standard deviation, etc.

1. Press Stat
2. Go over to tests
3. Scroll down until you see the test you want and hit enter

For this example we will use 2-sampleTTest

4. Go over to stats and hit enter (if stats is already selected skip this step)
5. Scroll down and enter in the information needed
6. Scroll down to μ_1 : and select your alternative hypothesis and press enter
7. Scroll down and change pooled to yes or no as needed (by pressing enter)
8. Scroll down to calculate and press enter

The t is the test statistic, and p is the p -value you need to make your decision about your hypothesis are given.

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

```
2-SampTTest
Inpt:Data STAT
x1:3
Sx1:2
n1:3
x2:3.666666666...
Sx2:1.52752523...
n2:3
```

```
2-SampTTest
↑Sx1:2
n1:3
x2:3.666666666...
Sx2:1.52752523...
n2:
μ1:≠μ2 <μ2 >μ2
↓Pooled: Yes
```

```
2-SampTTest
μ1 < μ2
t = - .4588314677
P = .3358686277
df = 3.740932642
x1 = 3
x2 = 3.666666667
```

Resetting the Calculator

If something is wrong with the calculator or you want to clear everything, you need to reset the calculator

1. Press 2nd + (MEM)
2. Select Reset (or press 7)
3. Select Defaults (or press 2)
4. Select Reset (or press 2)
5. A screen that says Defaults set will appear.

Warning: This will delete everything (numbers in lists, any functions in y=, games,...)

```
MEMORY
1>About
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7↓Reset...
```

```
RAM ARCHIVE ALL
1:All RAM...
2↓Defaults...
```

```
RESET DEFAULTS
1:No
2↓Reset
```

```
TI-84 Plus
2.55MP

Defaults set
```