

























Instructions

Ti-Inspire for statistics







General Introduction

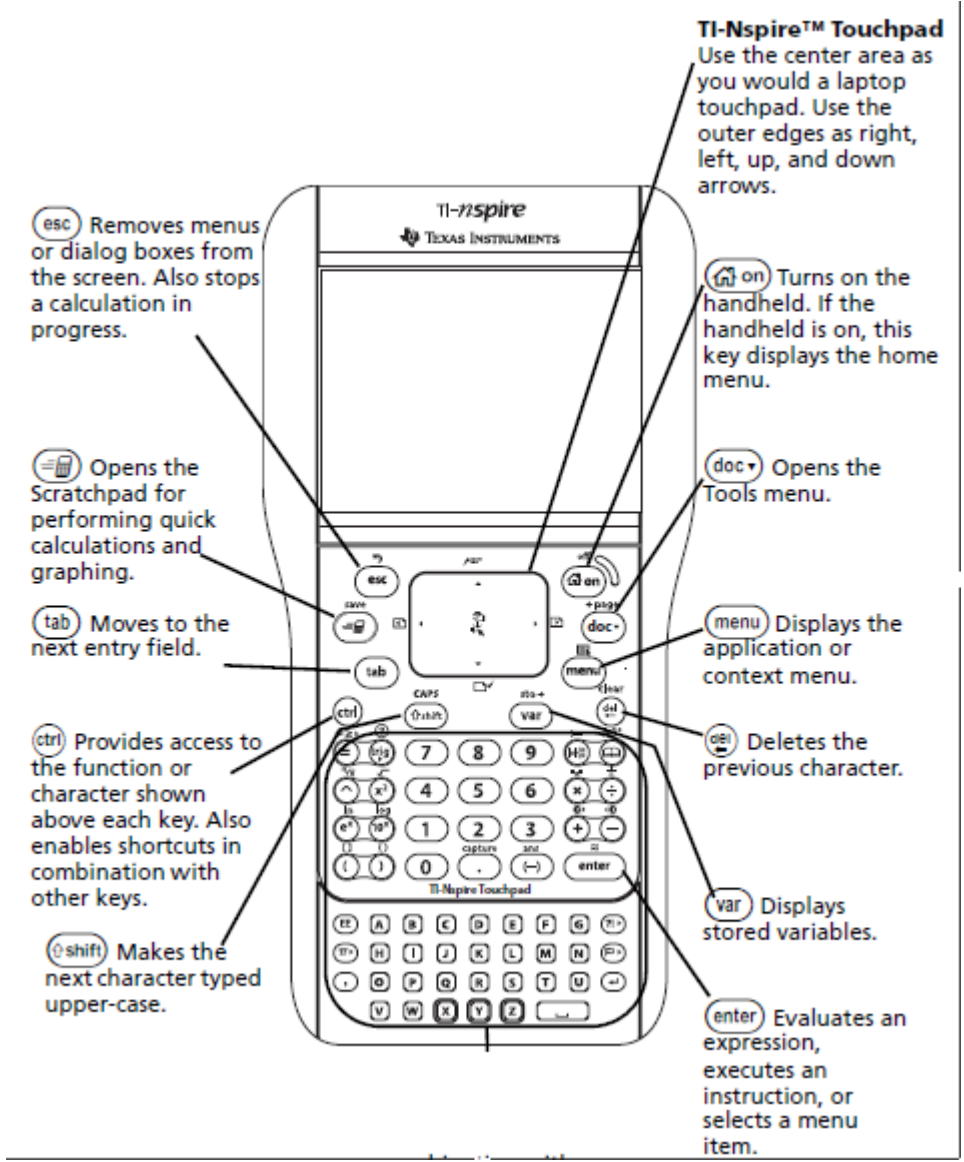
Editing Text

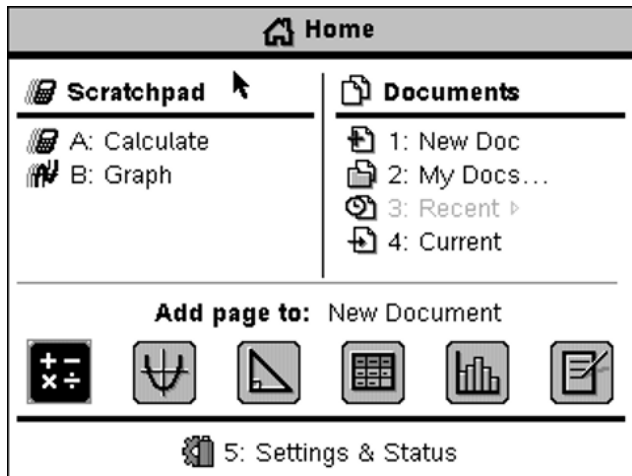
Cut	 
Copy	 
Paste	 
Undo	   
Redo	   
Toggle approximate and exact results	 

Clear	 
Caps Lock	 
Store	 
Square brackets	 

Modifying Display

Increase contrast	 
Decrease contrast	 
Power off	 



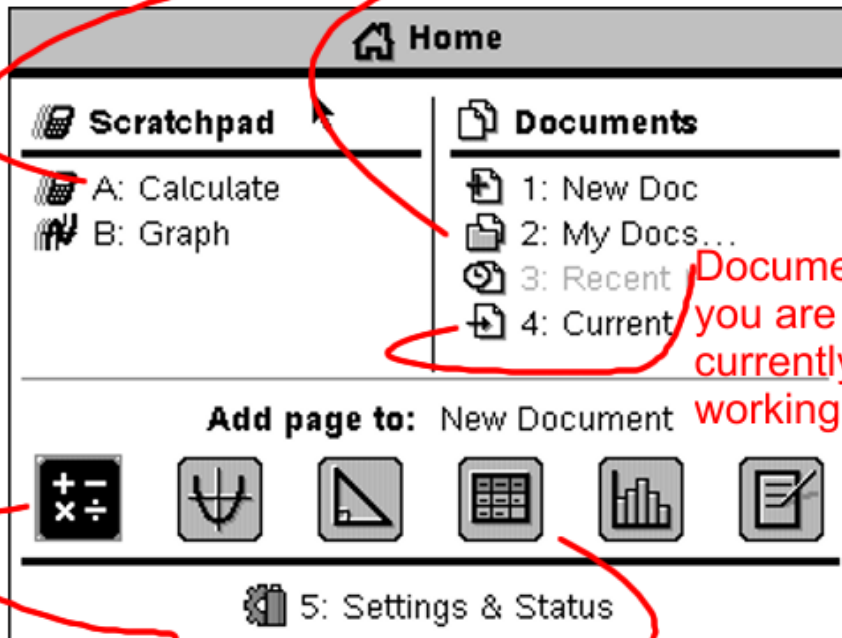


General Instructions

Press the On, Off button  to go to Home page

Page for fast calculation

open saved documents




Document(s) you are currently working on

Page for detailed calculations can be saved

Page for entering data can be saved



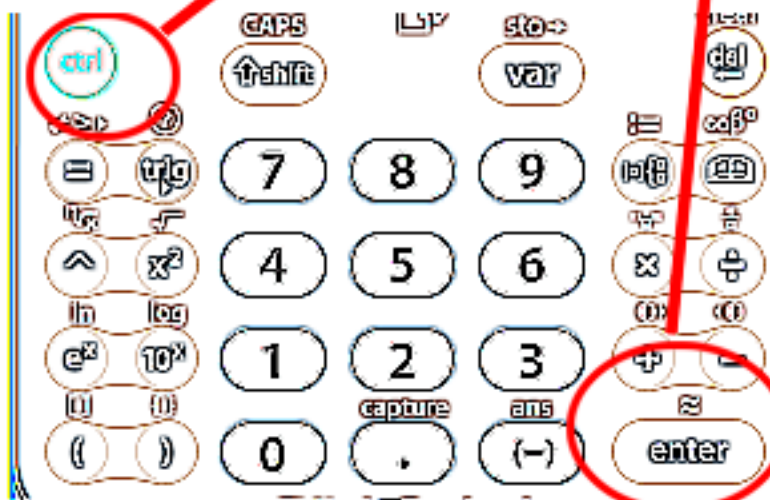
Use the  to navigate among the choices

To select an option press , the number or Enter(see below)



Important If you try to divide numbers TI-Inspire will give you a fraction since a decimal is only an approximation ¹

To get a decimal for a division problem press "ctrl" and hold then press "enter"



¹ Which I am more than happy to live with

Deleting

Highlight the item or column or number and hit “del”

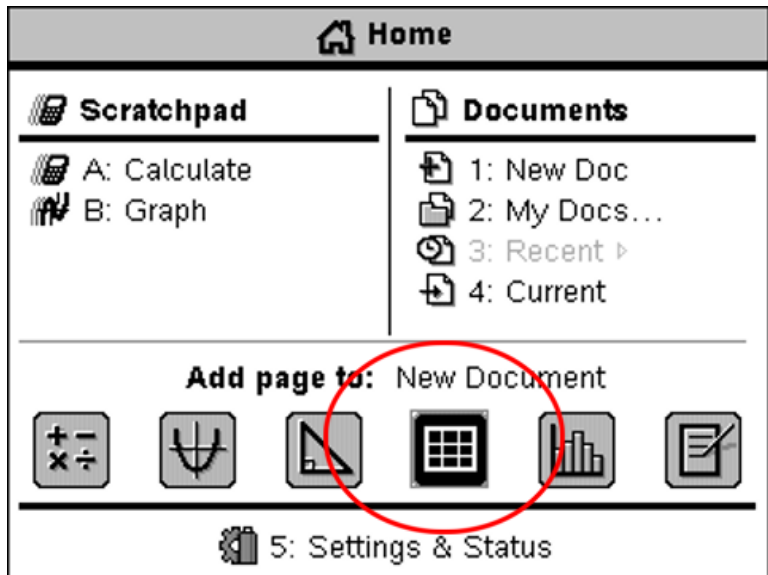


Finding Mean, Median and Mode

Step 1) Open list so you can enter your data



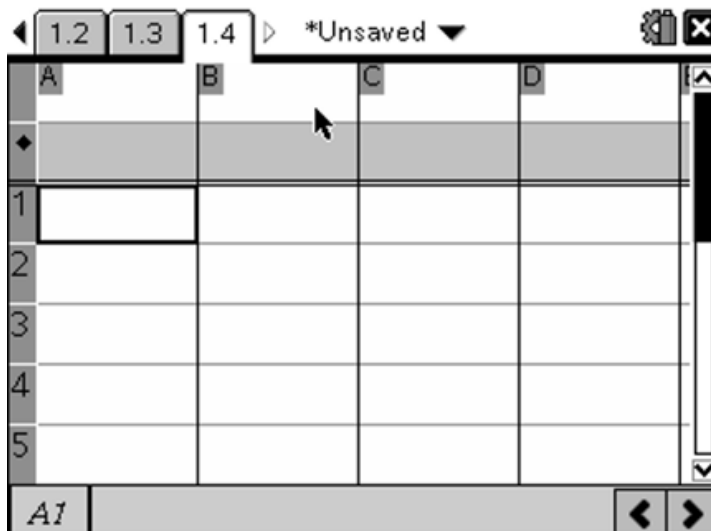
Press

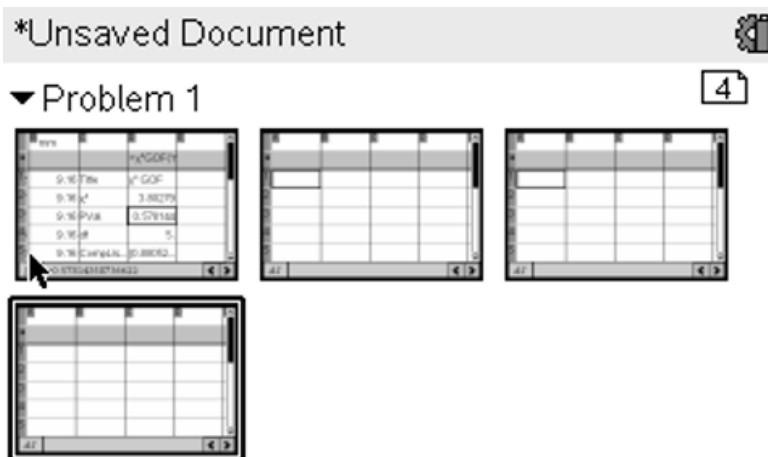
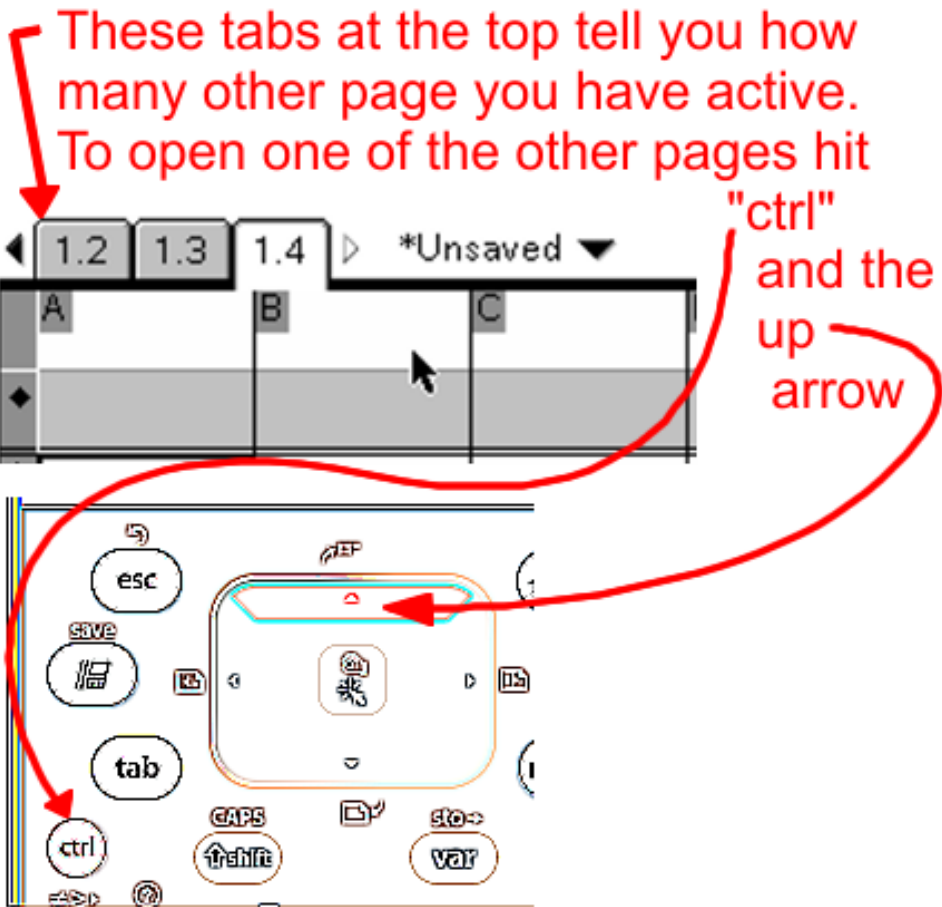


Click the above icon

A new document opens with Lists & Spreadsheet on the page.

Enter your data in a column (you could use any column)





use the arrow to select the page you want and then hit "enter" to go to that page

Problem: Find the mean of the number of hours of TV watched by a sample of freshmen men during their first week of college.

35, 28, 29, 31, 36, 26, 23, 34,19

Click [Menu]

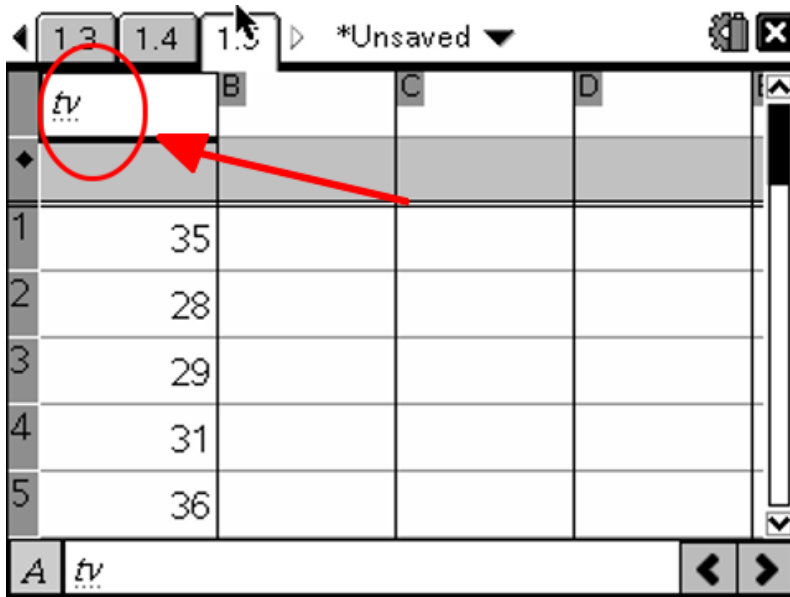


Enter the Data in the column

The image shows the TI-Inspire calculator's spreadsheet interface. The spreadsheet has columns labeled A, B, C, and D, and rows labeled 1 through 5. The data from the problem is entered into column B. The status bar at the bottom shows 'C1' and navigation arrows.

	A	B	C	D
1		35		
2		28		
3		29		
4		31		
5		36		

Give column a title if you wish otherwise it will be known by the letter above it.



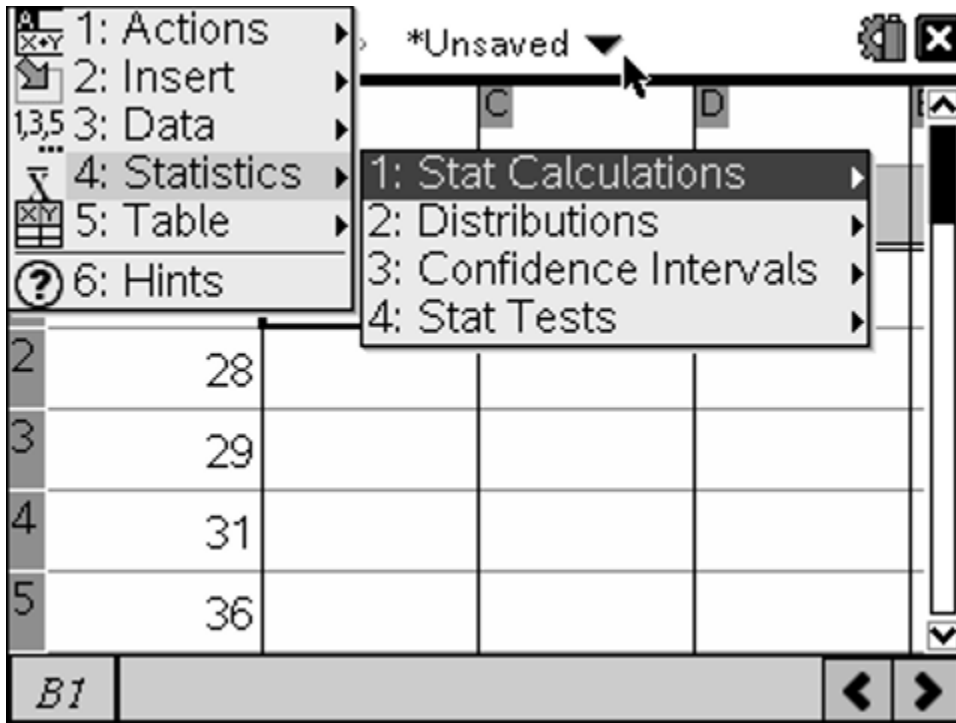
Use alphabet keys at the bottom of the calculator, Press [Menu]



Hit [Menu]

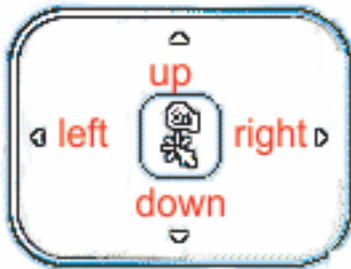


Choose "4: Statistics"

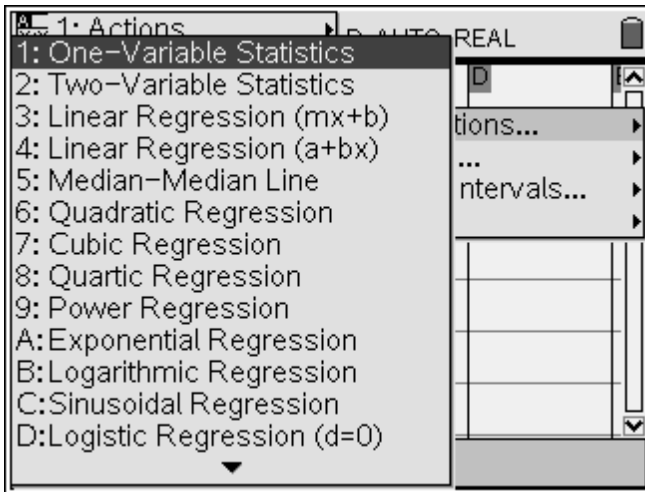


The choose 1: Stat Calculations

Use arrow on navigator button to move left/ right or up/down



Choose "1: One-Variable Statistics"

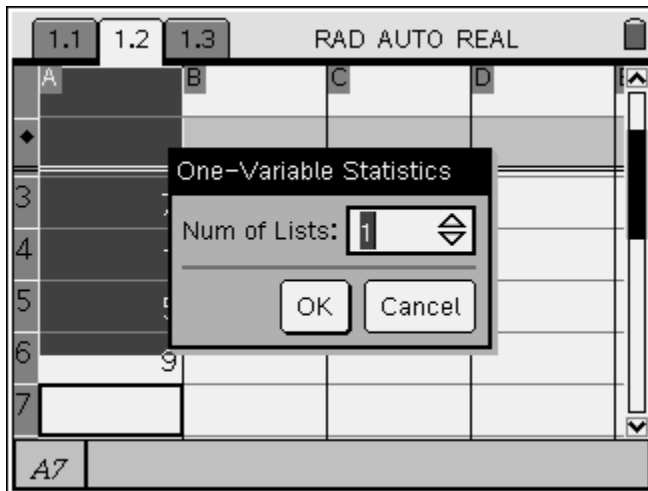


Choosing is done by either using the [Enter] button

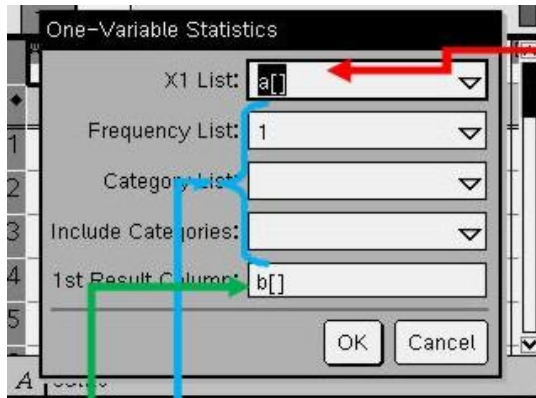
Or the hand in the center of the navigator button



Step 2) leave "num of lists" on "1" and



and then press [OK]



This tells the TI where the data is you want the mean of. If its in *b* or some other column change letter. You may also use the name of the column "*colas*"

to move between boxes
press

Leave the next three spaces alone

This one tells the TI in which column to put the answer. **Always** use an empty column because it will write over whatever is in the column.

Usually the TI tells you the empty one.

If you are recalculating and want to wipe out the old then you can do that too.

Press [OK]

	A	B	C	D
	tv			
			=OneVar('	
1	35	Title	One-Var...	
2	28	\bar{x}	29.	
3	29	Σx	261.	
4	31	Σx^2	7829.	
5	36	$s_x := s_{n-...}$	5.70088	

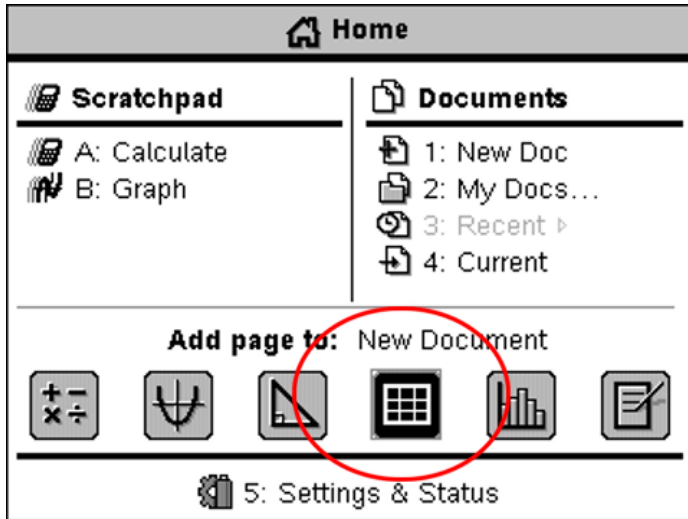
\bar{x} = mean (pronounced "X bar")

Scroll down for median and other data

Clearing column and/ or rows of Data

First columns

Use .



Go to

use center navigator button to the data entry button which will cause it to highlight
 click on it and go to the top of the column you want to clear

	1.1	1.2	1.3	RAD AUTO REAL	
A					
◆					
1		2			
2		3			
3		6			
4		5			
5		1			
A					

when column highlights



Hold down [ctrl] and hit [del]



Column will empty

Second rows: Again use the center navigator to go all the way to the left. When the row blackens hit the [Clear] button to empty the row

Several rows or several columns at the same time: Drag to select additional rows or columns

Copying rows or columns

Use the same procedure as above to highlight the row or column. When it is highlighted

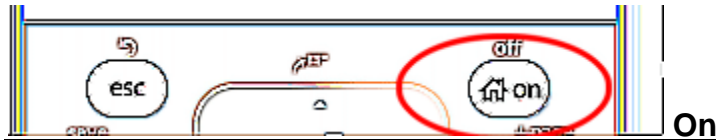


press [ctrl] C to copy a column or row and [ctrl] V to paste it.

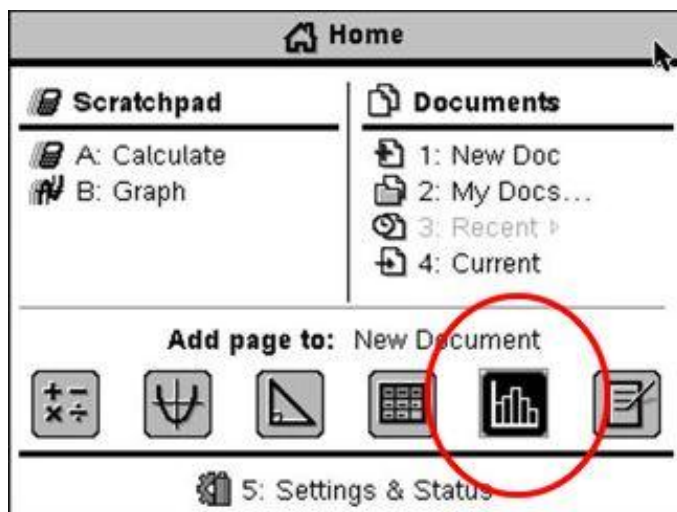
Constructing a Box plot

IMPORTANT: The column you want to turn into a box plot must have a name

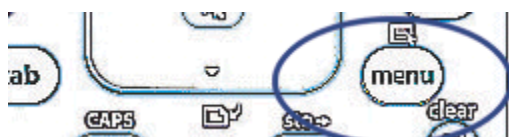
Add a new number to you list of freshman tv watches. This one watches 56 hours a week and probably will not be here the second semester.



Select Graph button to get a graph screen

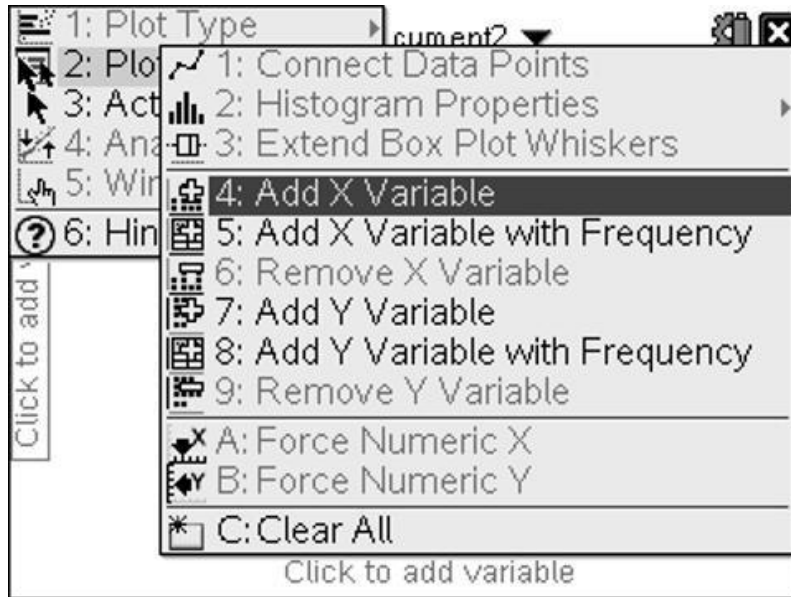


Use menu button

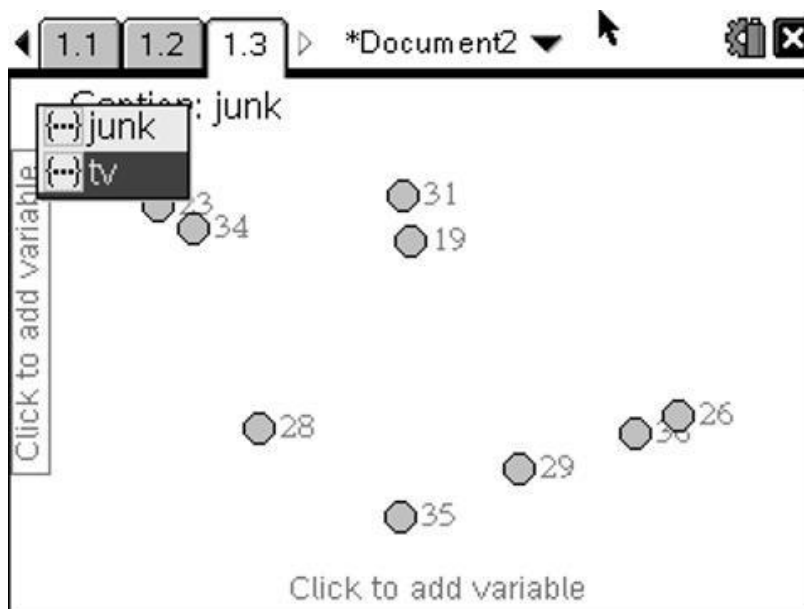


Choose 2: Plot Properties

Choose 4: Add X Variable

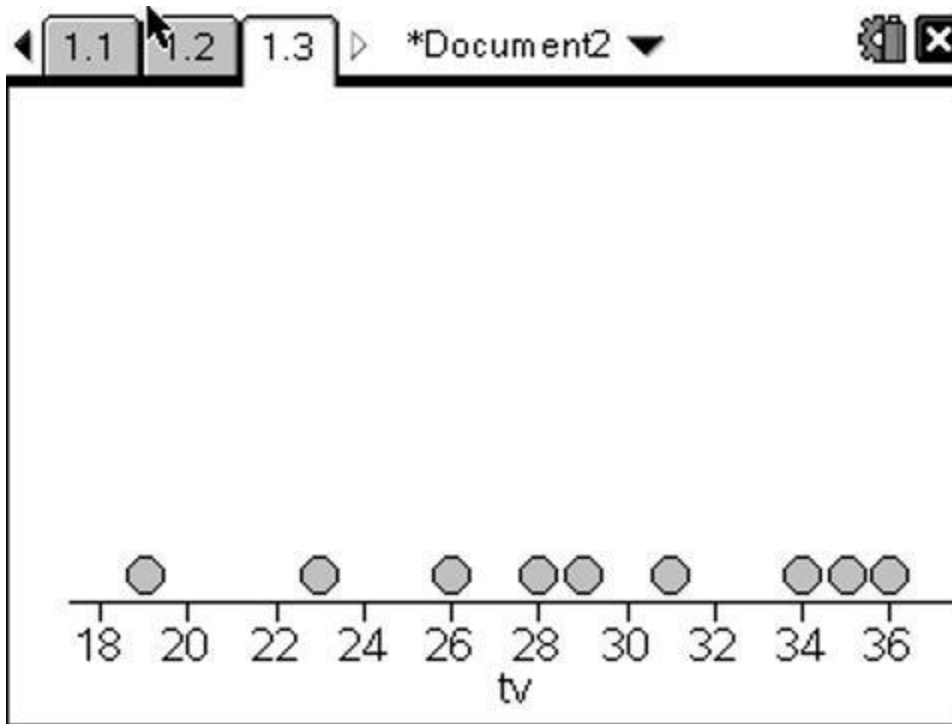



The name of your column of data will appear. If you have several columns of data they will all appear, plus some you have deleted. Pick the one you want to form a box plot of.



Use the arrow to get to the correct one which will be highlighted and click the hand.

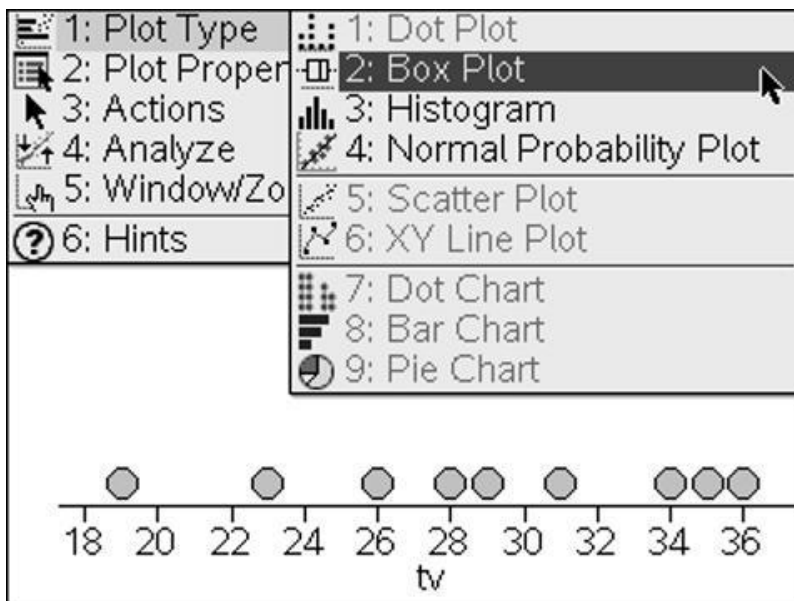
The screen will rearrange itself



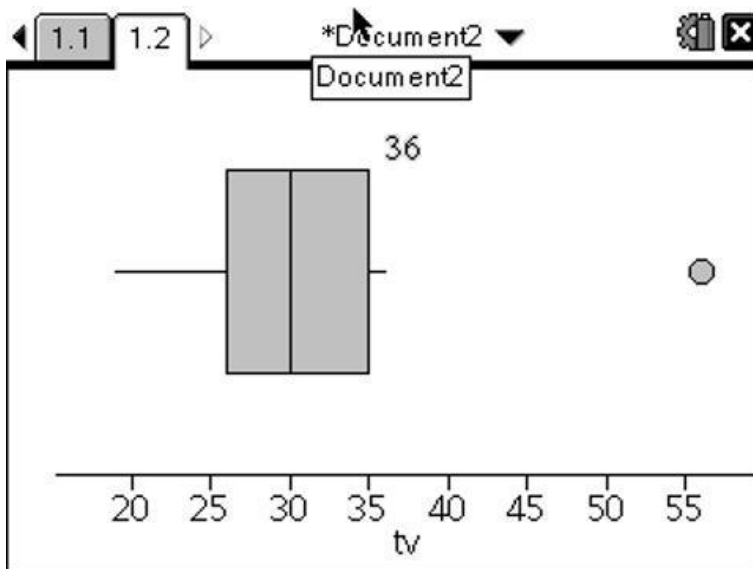
Press 

Then choose **1: plot Type**

Then **2: Box Plot**

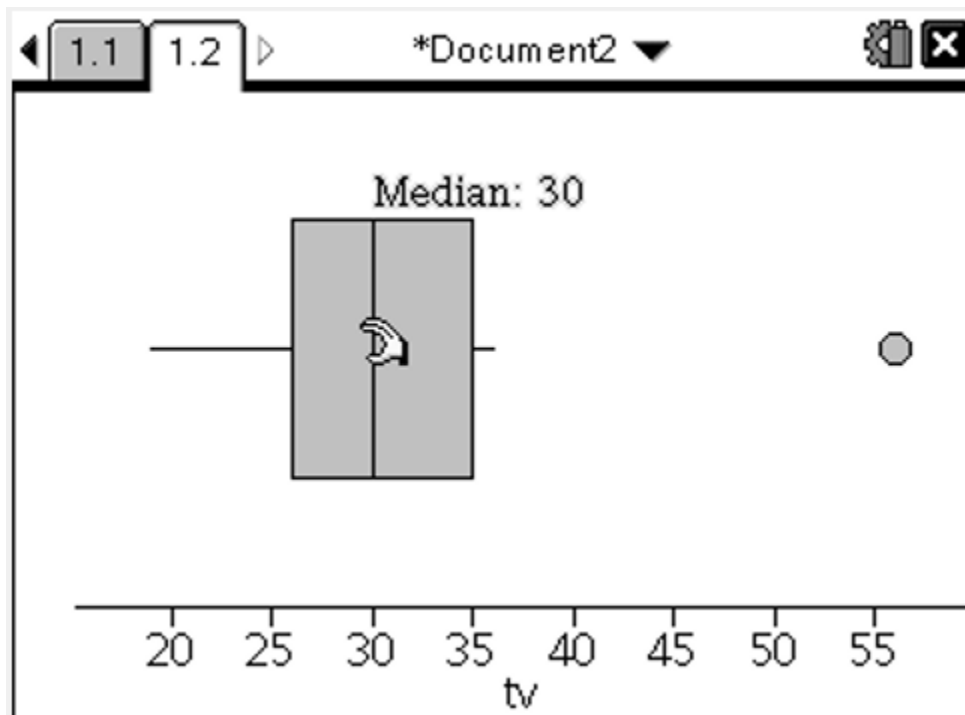


Use the arrow move the and hand

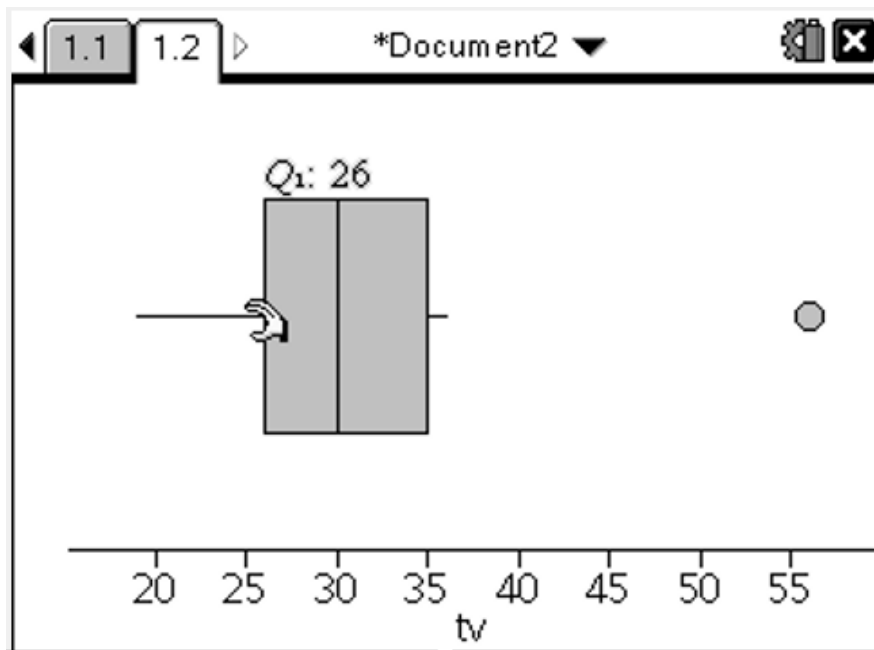


the number that appears is the where the outliers start. In this case "36 " is not an outlier but anything greater is

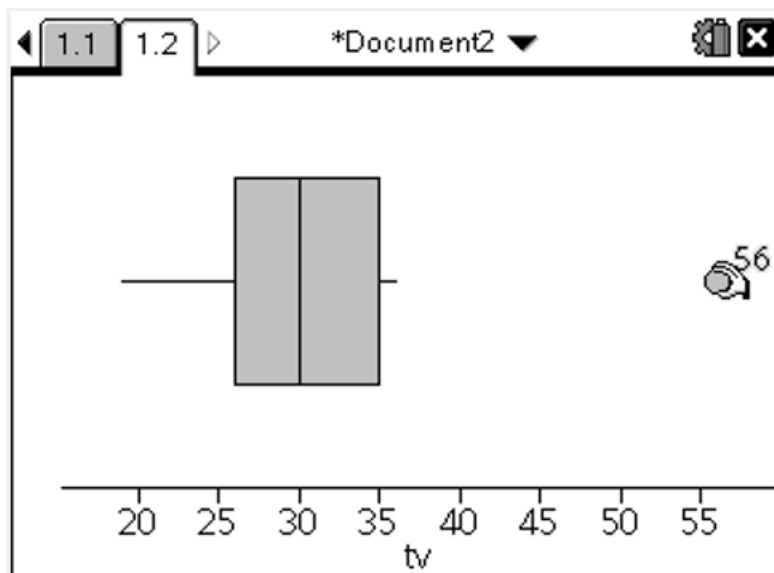
Move the hand to the line in the middle of the box and it will give you the median. In this case 30



Move the hand to the bottom of the box and it will give you Q1, etc.



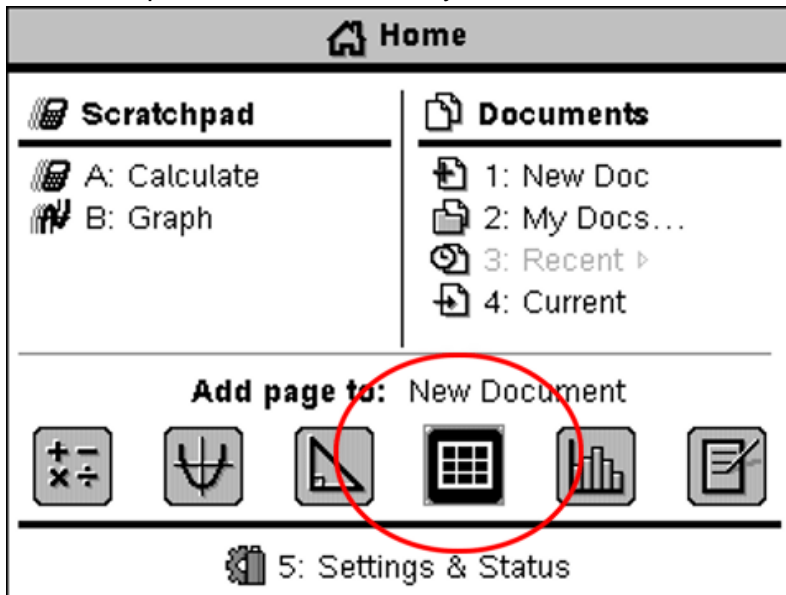
The dot by itself to the left is an outlier and is our 56 hour tv watcher




How to find Standard Deviation

Press Home

List & spread sheet/ Data Entry



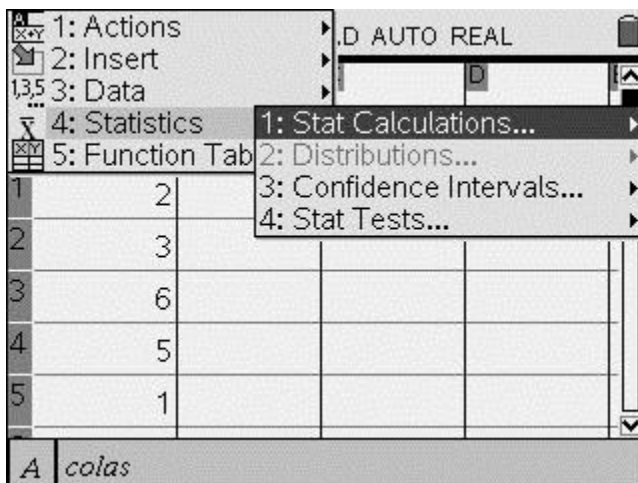
Enter data and give column name if you wish

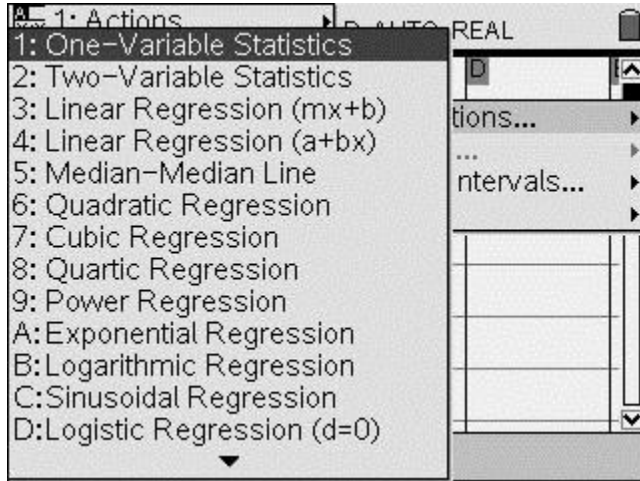
Press 

4:Statistics

1: Stat Calculations


1:One Variable Statistics

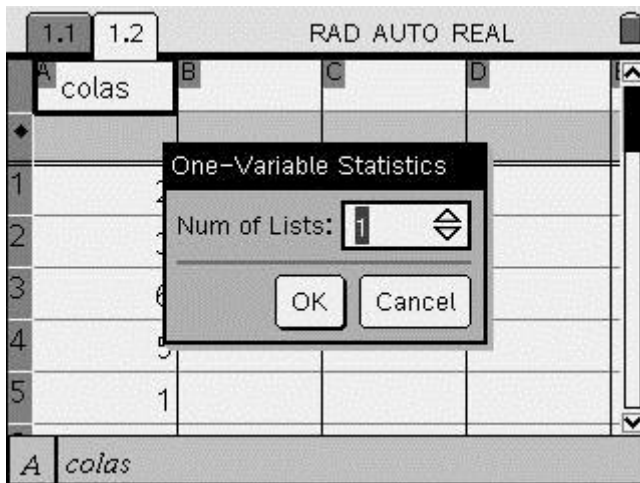


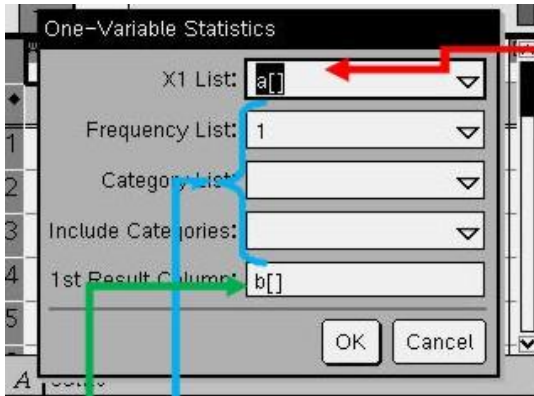


Press center button or Enter

leave on "1"

press  to [OK] and press





This tells the TI where the data is you want the mean of. If its in *b* or some other column change letter. You may also use the name of the column "colas"

to move between boxes
press (tab)

Leave the next three spaces alone

This one tells the TI in which column to put the answer. **Always** use an empty column because it will write over whatever is in the column.

Usually the TI tells you the empty one.

If you are recalculating and want to wipe out the old then you can do that too.

Press [OK]

In the first slot put the letter or name of the column that holds the data you want the Standard Deviation of

Tab to the last slot

Put the letter of the column where you want the results to appear. Generally choose an empty column



Use navigator button to move up and down the results

Sx is the standard deviation for a sample **and the one you want to use**

1.1		1.2		RAD AUTO REAL	
A	colas	B	C	D	
					=OneVar(a
1	2	Title	One-Var...		
2	3	\bar{x}	2.90909		
3	6	Σx	32.		
4	5	Σx^2	130.		
5	1	$s_x := s_n \dots$	1.92117		
C2		=2.909090909090909			

σ_x is the standard deviation for a population

1.1		1.2		RAD AUTO REAL	
A	colas	B	C	D	
					=OneVar(a
6	4	$\sigma_x := \sigma_n \dots$	1.83177		
7	5	n	11		
8	0	MinX	0.		
9	2	$Q_1 X$	1.		
10	1	MedianX...	3.		
C10		=3.			

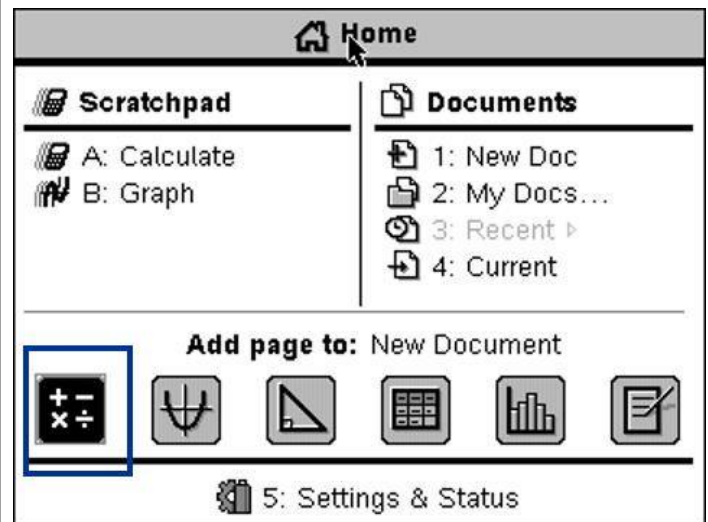
One sample Z-test

Local citizens have been concerned that the reading program in the public schools may be inferior . The superintendent hires you to conduct an experiment to investigate. You set $\alpha = 0.05$ (alpha level) for making your decision. You compare the reading level of current high school seniors with established norms. The norms are compared to national reading proficiency norms and are normally distributed with $M = 75$ and $SD = 16$. You administer the reading test to 100 randomly selected high school seniors in your city. The obtained mean of the sample = 72. What is your conclusion?

[On]

[Home]

Calculator button at bottom
push center/Enter



[Menu]

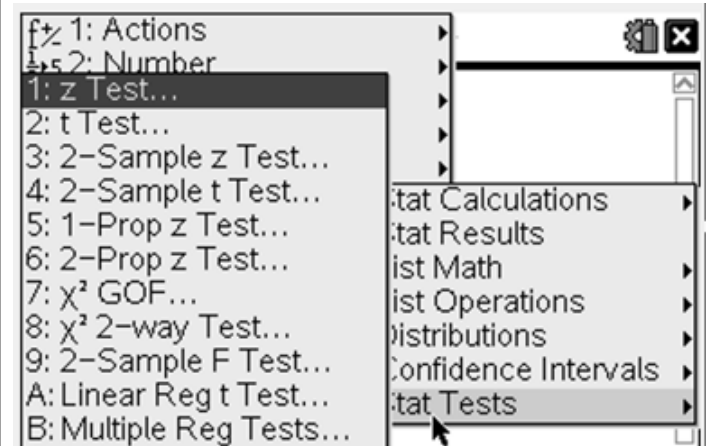


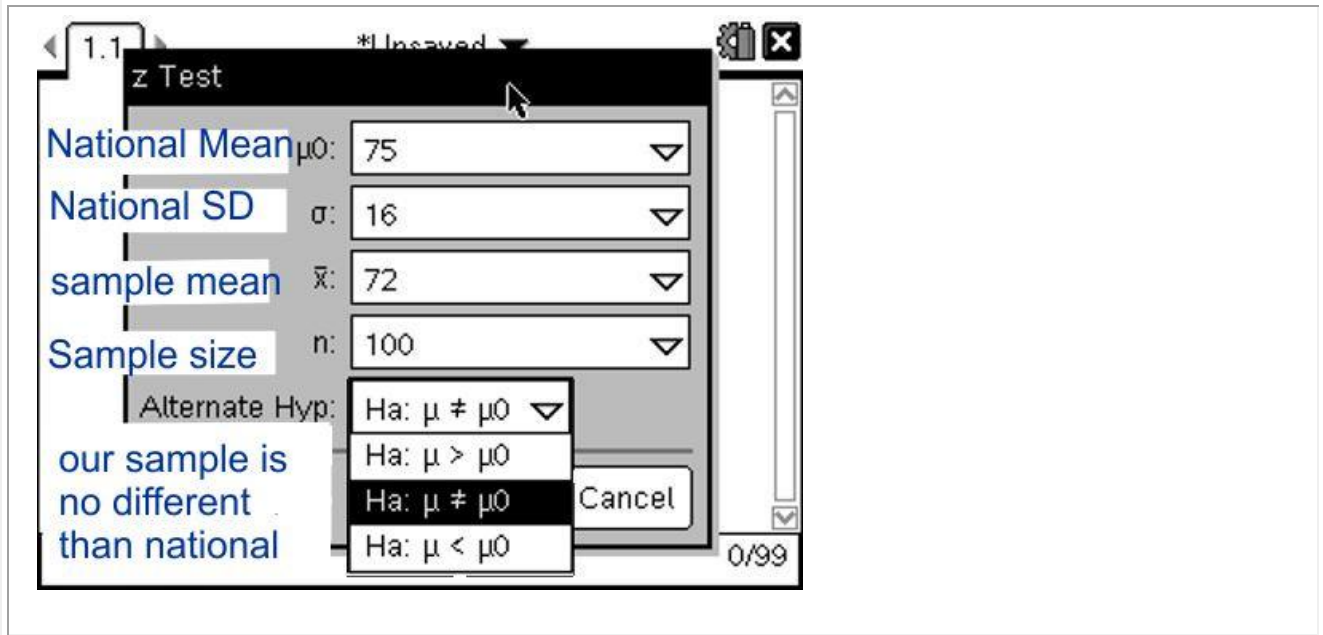
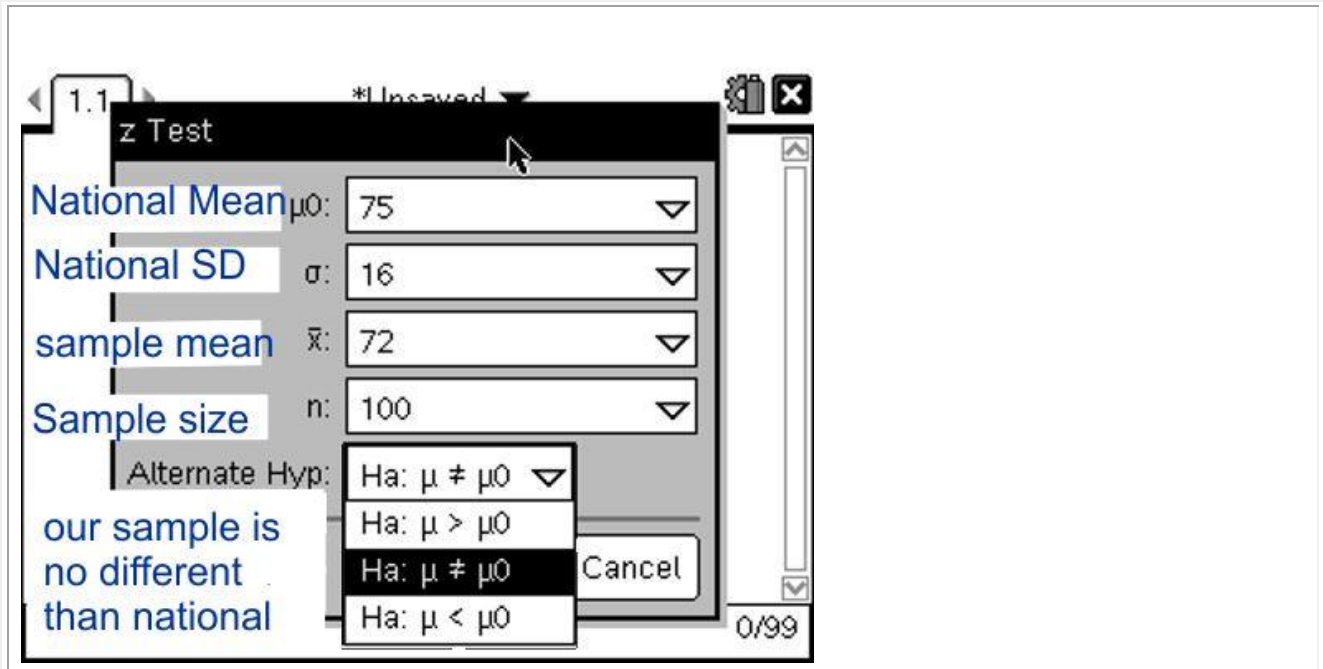
6:Statistics

7: Stat Tests

1:zTest

Push center





Tab to [OK]

zTest 75,16,72,100,0: *stat.results*

"Title"	"z Test"
"Alternate Hyp"	" $\mu \neq \mu_0$ "
"z"	-1.875
"PVal"	0.060793
" \bar{x} "	72.
"n"	100.
" σ "	16.

1/99

The results are not significantly different.
 $Z(100) = -1.875$, $p > .05$

However, at .060 it's awful close to being significantly different!

One sample T-tests

The United States has the highest teen pregnancy rate in the western world, despite the fact that US teens are not more sexually active than Swedish teens, Canadian teens, or British teens.

The mean teenage pregnancy rate in the US is 11.85%

The rates for states in the this area (based on survey of 15-19 year olds)	
Arkansas	17.28%
Mississippi	18.75
Louisiana	17.05%
Texas	15.25%

H₀: *There is no significant difference in the pregnancy rate of the states of Arkansas, Mississippi, Louisiana and Texas compared to the rest of the nation*

H_A: *There is no significant difference in the mean teenage pregnancy rate of the four states sample and the US average.*


Other Alternative hypothesis are of course possible.

The screenshot shows a TI-Inspire spreadsheet with the title 'RAD AUTO REAL'. The spreadsheet has columns labeled B, C, and D, and rows numbered 1 through 5. The data in column A is as follows:

	B	C	D
teen			
1	17.28		
2	18.75		
3	17.05		
4	15.25		
5			

The status bar at the bottom shows 'A teen'.

The data (the rates for Arkansas, Mississippi, Louisiana, & Texas) is in the form of a list it should be enter in column A on the Lists and Spreadsheet page and given a title.

Press 

The screenshot shows the TI-Inspire menu system. The main menu is open, and the '4: Statistics' option is selected. A sub-menu is displayed with the following options:

- 1: Stat Calculations...
- 2: Distributions...
- 3: Confidence Intervals...
- 4: Stat Tests...

The spreadsheet in the background shows the same data as the previous screenshot, with the status bar displaying 'A1 17.28'.

then choose 4: Statistics

then choose 4: Stat Tests

The screenshot shows the TI-Inspire menu system. The main menu is open, and the '2: t Test' option is selected. A sub-menu is displayed with the following options:

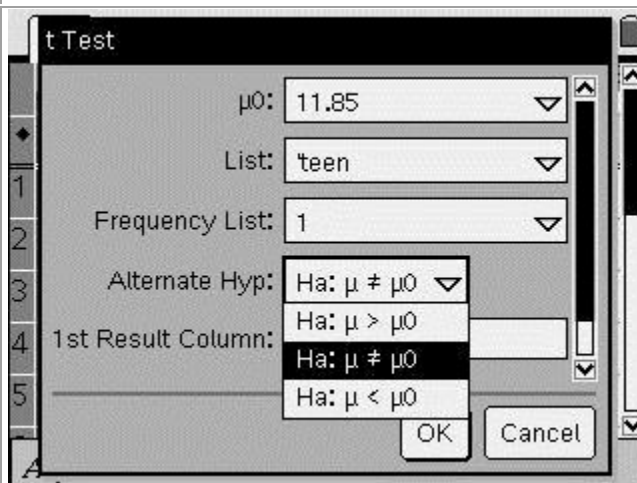
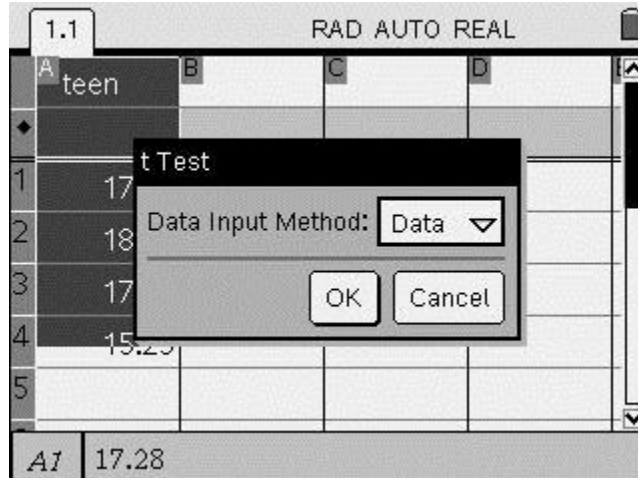
- 1: z Test
- 2: t Test
- 3: 2-Sample z Test
- 4: 2-Sample t Test
- 5: 1-Prop z Test
- 6: 2-Prop z Test
- 7: χ^2 GOF
- 8: χ^2 2-way Test
- 9: 2-Sample F Test
- A: Linear Reg t Test
- B: Multiple Reg Tests
- C: ANOVA
- D: ANOVA 2-Way

The spreadsheet in the background shows the same data as the previous screenshots, with the status bar displaying 'A1 17.28'.

Choose 2:tTest. It is designed to test your sample against a larger or national known mean

Choose “Data” because you entered your data into a column on the List and Spreadsheet page.

Click [OK]



μ_0 : is for the sample or national mean you are comparing to

List: is the column where you put the data from your sample

Frequency: always 1

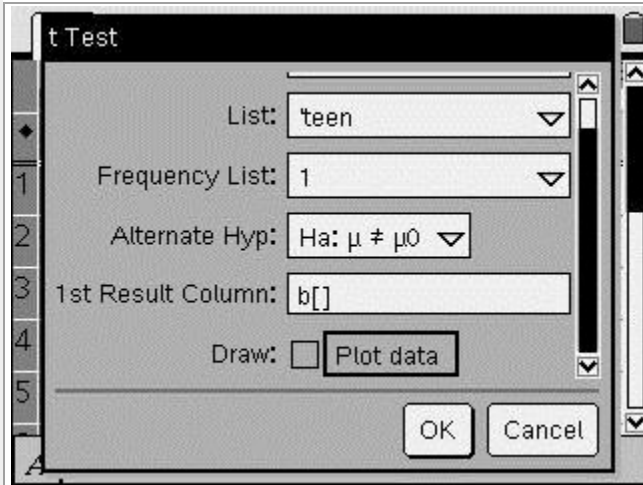
Alternate Hyp: Three hypothesis are possible

A two sided **$H_a: \mu \neq \mu_0$** My sample mean is significantly different from the population mean, great or less it doesn't matter it's just significantly different.

Two one sided or directional

$H_a: \mu > \mu_0$ My sample is greater, bigger, more than, etc. the national mean

$H_a: \mu < \mu_0$ My sample is less than, fewer, smaller, etc. the national mean



1st result column: says it will put the results in the first available column. You can overwrite previous results by changing the column letter.

Try Draw plot for the fun of it but generally it doesn't give you the information you want.

[OK]


	A	B	C	D
	teen			
1	17.28	Title	t Test	
2	18.75	Alternate...	$\mu \neq \mu_0$	
3	17.05	t	7.29209	
4	15.25	PVal	0.005324	
5		df	3.	

These results would be reported as $t(3) = 7.29, P < .006$.

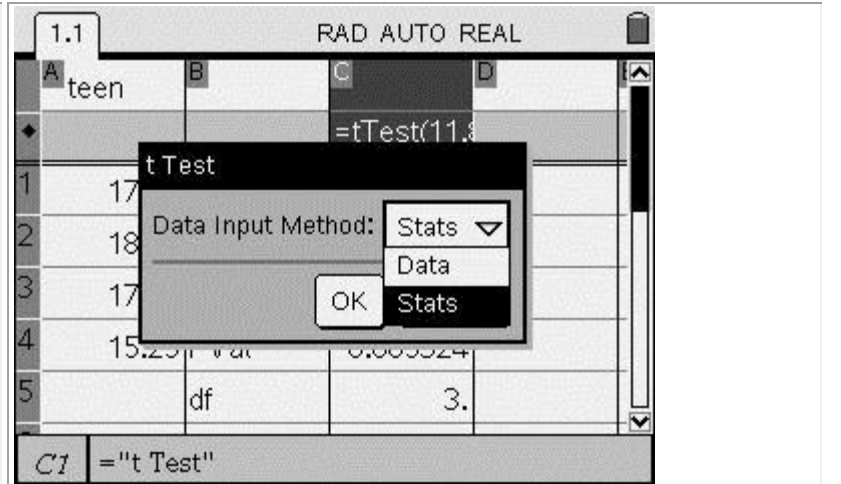
However, if you are given the mean for the data the procedure is different

The average age of mothers in the US when they give birth to their first child is 25.1. The average age of a sample of 200 women from the Arkansas Delta region is 21.7 $S_x = 2.6$.

Our hypothesis is: **Ha: The age of mothers giving birth to their first child is significantly lower in the Delta region of Arkansas than the national average of the sample is significantly lower than the national average. Ha: $\mu < \mu_0$**

Press 

- 4: Statistics
- 4:Stat Tests"
- 2:t-test
- choose "Stats" this time



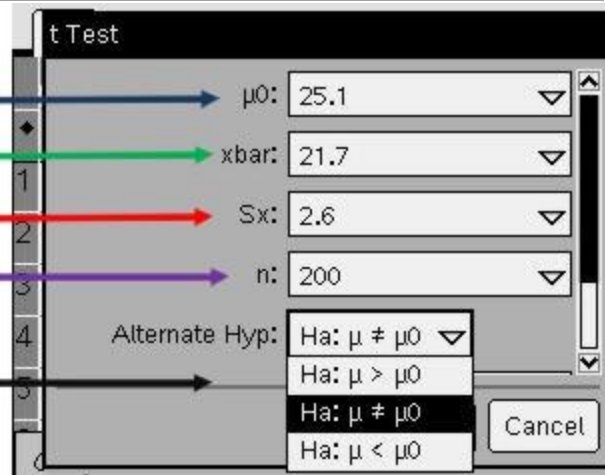
National mean you are comparing your sample to

The mean of your sample

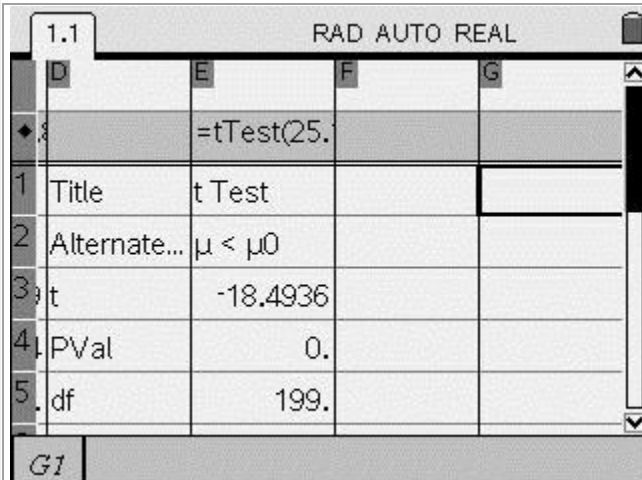
Standard Deviation of your sample

Number in your sample

Pick your hypothesis



Pick a column for the results and skip "plot"



These results would be written: A significant difference ($p < .000$) was found in the mean age for mother giving birth to their first child in the Arkansas Delta region than the national average. $t(199) = -18.49, p < .000$. With the mean for the nation being 25.1 and the mean for the delta region of Arkansas being 21.7.

Means are usually given in addition to the t scores when the difference is significant.

Two Independent Sample T-Test

This t-test is used when you have two separate sample that you are comparing. (They do not have to be the same size.) Ie. Rainfall in one city to rainfall in another, female scores on a self-esteem test compared to males scores on the same test.

The Inspire has a 2-Sample T-Test

Enter the data for the two groups you are comparing in two, usually columns 1 & 2. Give them a title

[menu]

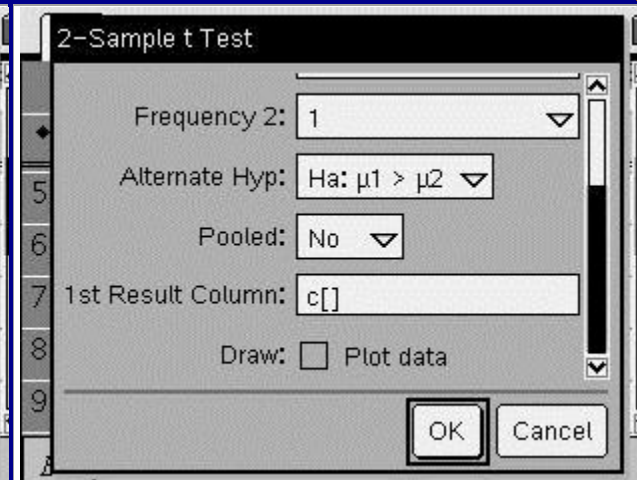
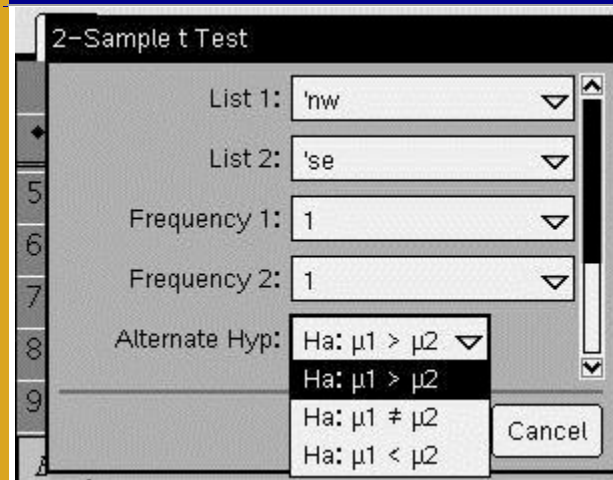
4:Statistics

4:Stat Tests

4:2 Sample t Test

If you entered data in the columns choose "Data"

If you have μ , σ and n then use "Stats"



Enter Data into 2 columns and title

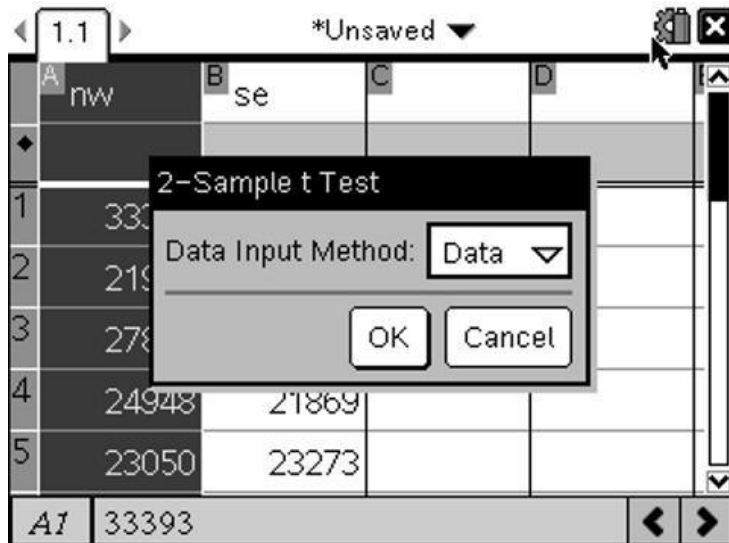
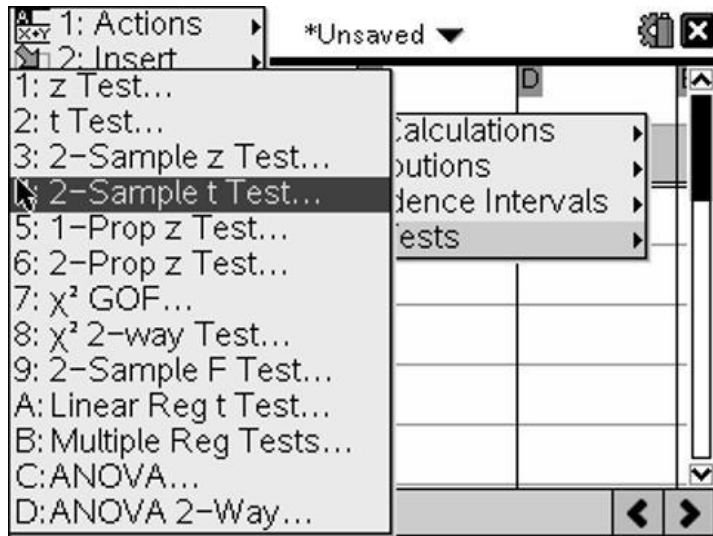
	A	B	C	D
	nw	se		
1	33393	20056		
2	21963	24721		
3	27876	19704		
4	24948	21869		
5	23050	23273		

[Menu] 4: Statistics 4:Stat Tests

	A	B	C	D
	nw	se		
1	33393	20056		
2	21963	24721		
3	27876	19704		
4	24948	21869		
5	23050	23273		

- 1: Actions
- 2: Insert
- 3: Data
- 4: Statistics
 - 1: Stat Calculations
 - 2: Distributions
 - 3: Confidence Intervals
 - 4: Stat Tests
- 5: Table
- 6: Hints

4: 2-Sample t Test



You have data in calculator choose "Data" format [OK]

Put in name of two columns with data (NW and SE)

- List 1 is your first column of data. Click on the Down arrow and pick your column title from the list
- List 2 is your second column of data again pick the name from the list

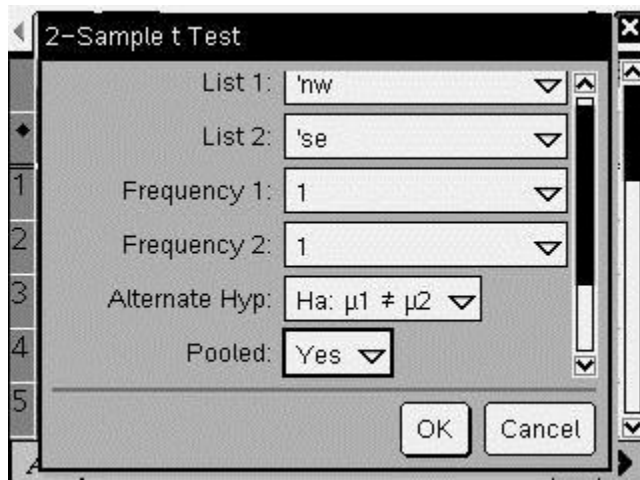
Leave “Frequency” as 1

Choose you Alternative hypothesis (Ha:) from the drop down list

- $\mu_1 > \mu_2$ the first group is significantly more , faster, greater, etc. than the second group
- $\mu_1 < \mu_2$ the first group is significantly less than, smaller, etc, than the second group
- $\mu_1 \neq \mu_2$ the difference between group 1 and group 2 is not significant

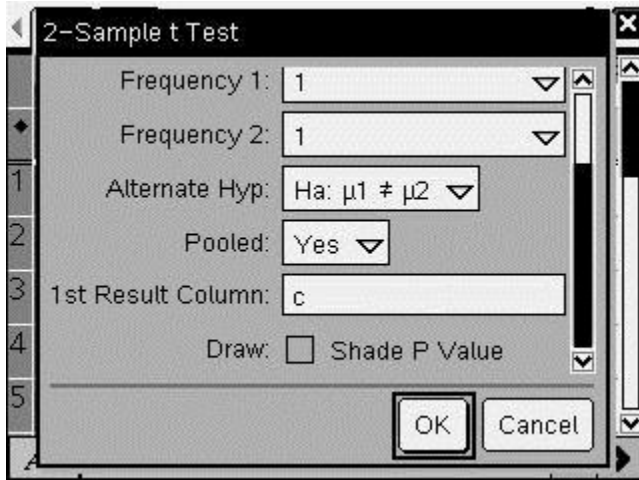
Choose hypothesis HA: NW will have higher incomes the SE

HA: $\mu_1 > \mu_2$



Pooled “Yes” (If in doubt choose “pooled”)

Put results in empty column C[] or whatever empty column you want



[OK]

*Unsaved			
A	B	C	D
nw	se		=tTest_2S
21963	24721	Alternate...	$\mu_1 > \mu_2$
27876	19704	t	2.60833
24948	21869	PVal	0.013062
23050	23273	df	9.9963
27555	22256	\bar{x}_1	25960.8

t = t value

PVal = probability

df = degrees of freedom

\bar{x}_1 = mean of column 1

	nw	se		=tTest_2S
6	27555	22256	$\bar{x}1$	25960.8
7	24564	22699	$\bar{x}2$	22270.5
8	24337	23586	sx1	3615.75
9			sx2	1714.5
10			n1	8.

$\bar{x}2$ = mean of column 2
 Sx1 standard deviation column 1
 Sx2 = standard deviation column 2

D1 = "2-Sample t Test"

Results

$$t(9.9)=2.6, p<.02$$

You should also report Means and SD.

NW Ar = \$25,960.80, S = \$3615.75 and SE Ar = \$22,270.50, S = \$1714.5. Not only is the average income in the north west higher than the southeast but the variance is smaller in the southeast

Matched pairs t-test

- Put Data in **Column A** and **Column B**
- move to the third column "C" and title it "diff"
- In the area just below the title but above the data area type the following formula

$$=a[]-b[]$$

this tells the calculator to subtract the data in column 2 from column 1 and put results in column 3

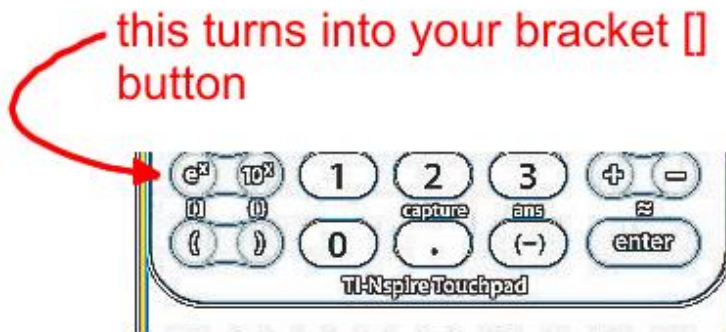
	B news	C diff	D	E
1	4			
2	7			
3	3			
4	9			
5	5			

	B news	C diff	D	E
		=a[]-b[]		
1	4			
2	7			
3	3			
4	9			
5	5			

Use the "ctrl"



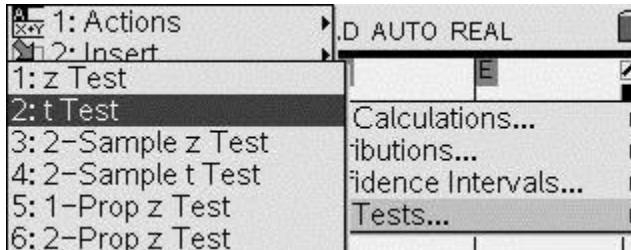
this turns into your bracket [] button



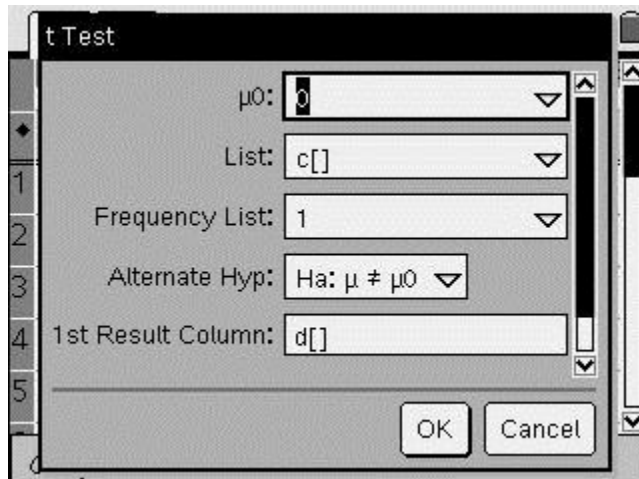
Go to

Menu

- 4: Statistics
- 4: Stat Test
- 2:t test



you are **not** using the 2 sample t-test because you are measuring the actual difference against "0" which is what the average difference would be if there is no difference

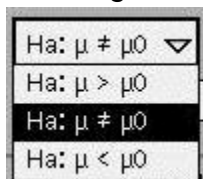


Data Input method" is "data"

For μ use "0"

List: where you want the results
Frequency: "1"

Deciding on H_a : is a little tricky: The easiest way is two do a two tailed test



If you believe there will be a difference but uncertain of the direction H_a : $\mu \neq \mu_0$

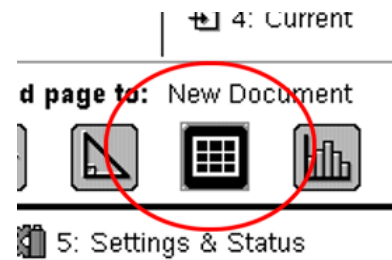
However is you wish to do a one tailed the easiest way is to always put the group you think will be "more", "greater" "bigger", "better", larger" etc. in the first column A[] and the group you think will be "less", "smaller", "fewer" in the second column B[]. And then always choose $H_a:\mu>0$

Anova

Doing an ANOVA on the TI is amazing simple if you have been doing t-tests

Push the [On/Home] button

Find the press the List and Spreadsheets icon



Put each list of data in a different column (as this example has)

	1.1	1.2	1.3	RAD AUTO REAL			
A	fr	B	soph	C	jr	D	sr
1		3	6	9	12		
2		5	7	10	13		
3		6	9	15	15		
4		2	7	12	18		
5		1	11	11	15		

[Menu]

4: Statistics

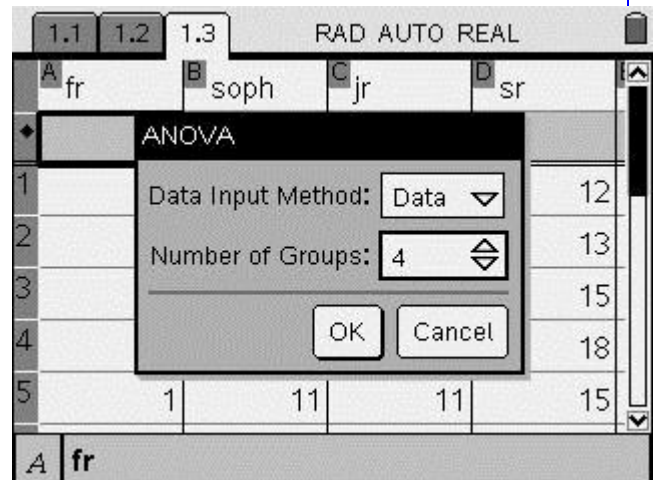
4: Stat Test

C:ANOVA

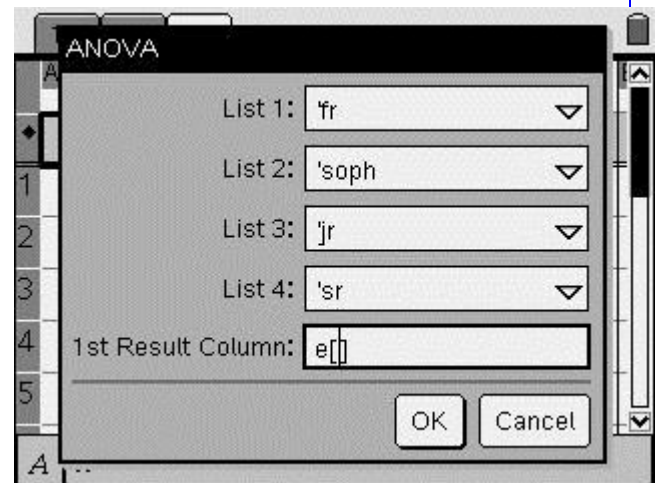
[ENTER]

Choose "data"

Enter the number of groups(
number of columns)



Choose the names of the groups or use a A[] etc.
Put results in empty column
[OK]



Read results and create a Source or Summary Table

Results are reported both in form of a Source table and as $F(3, 20) = 32.68; p < .01$

Source	SS	df	MS	F	p
Between	413.500	3	137.833	32.685	<.001
Within	84.333	20	4.217		
Total	497.833	23			

Correlations

Enter the data you want to correlate into two columns in the Data and Spreadsheet. This would usually be *columns A [] and B []*, title them .

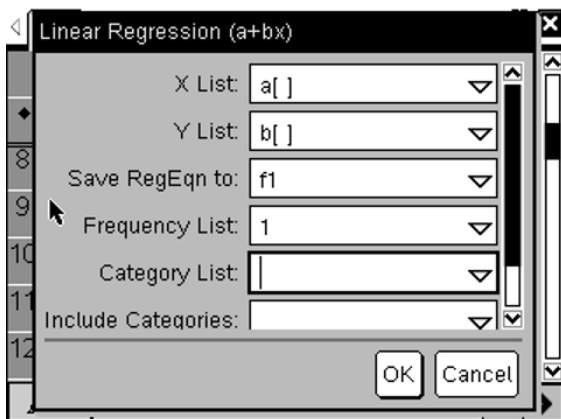
Punch [menu]

"4:Statistics"

"1: Stat Calculations"

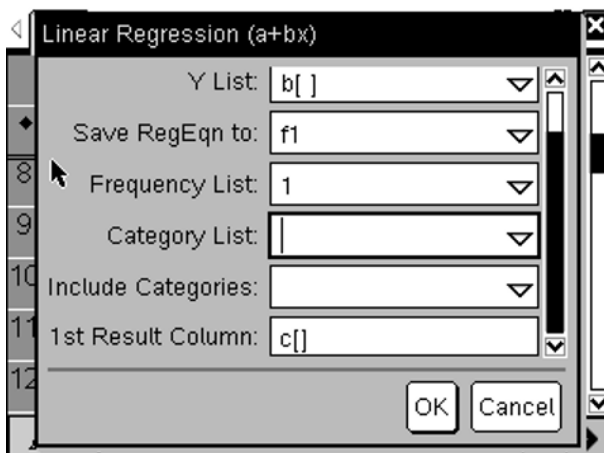
"4:Linear Regressions(a+bx)

There is also a 3: Linear Regression with the formula $(mx+b)$ This one will give you a correlation but it will also give you extra data you don't want to bother with. Avoid it.



X List is usually the factor you believe affects the second. If you just believe there is a relationship either factor can be X

Y List is usually the factor affected by the X factor. Again if you are just positing a relationship either factor can be Y



Leave "Save RegEqu to" alone

Leave "Frequency" as "1"

Skip "Category List" and "Include Categories"

Put results in an empty column

	B	C	D	E
	y			
			=LinRegBx	
2	874	RegEqn	a+b*x	
3	1197	a	492.793	
4	285	b	10.5986	
5	1216	r ²	0.771382	
6	950	r	0.878283	

r = correlation

Regression

Getting **a** and **b** on the TI-Nspire to run a regression

Run a correlation and look again it gives you **a** and **b** (see example above)

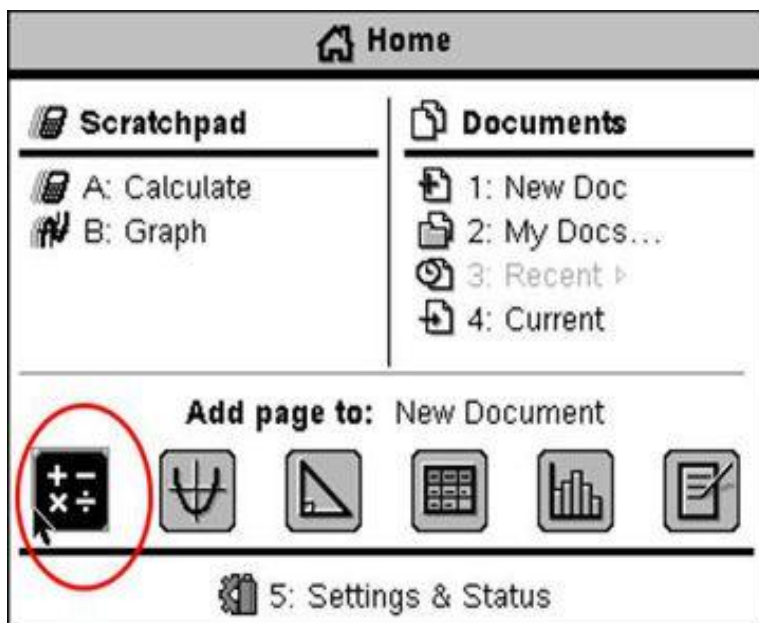
Chi Square

As an example assume the following Chi Square or matrix

	Believes in Santa	Does not Believe in Santa	Undecided about The jolly old man
male	35	43	27
female	43	25	10

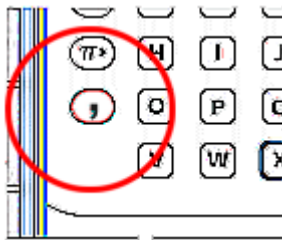
First set up a matrix with your number

- choose calculator page (not scratch pad)



On the calculator page type a: = [35,43,27:43,25,10]

[ctrl] and “(“ will give you the brackets []



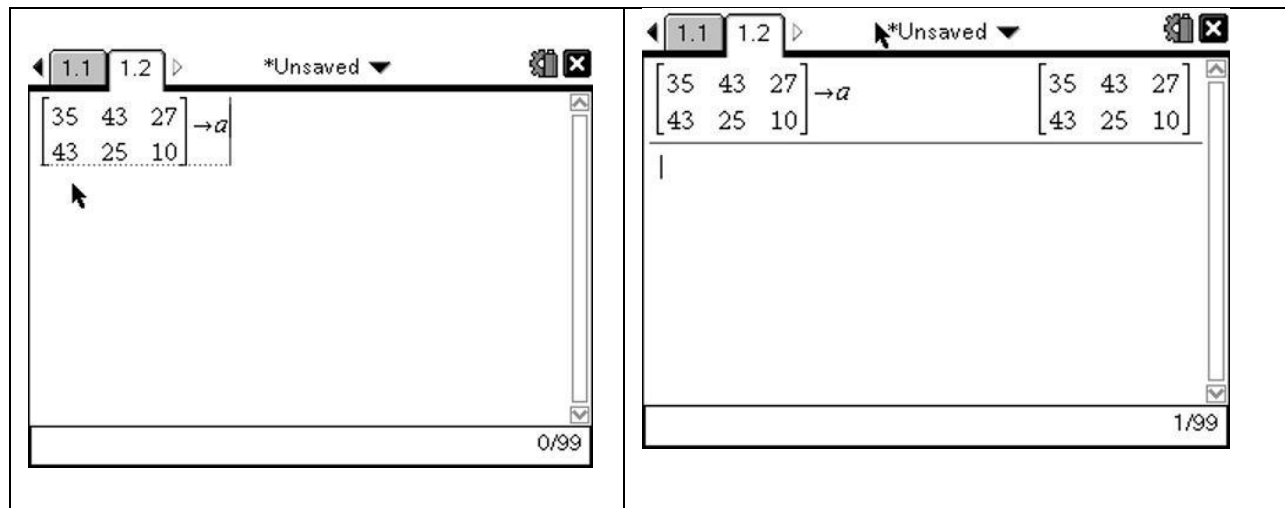
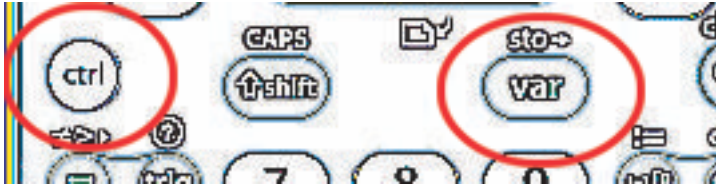
The comma is the left of the “o”

The semi-colon is activated by the “?|▶” button which produces a number of special symbols.
Choose semi-colon



After you have closed the bracket store the matrix in letter “a” you can store it in a different letter if “a” is already being used.

The store command “sto→” is activated by “ctrl”



[Menu]

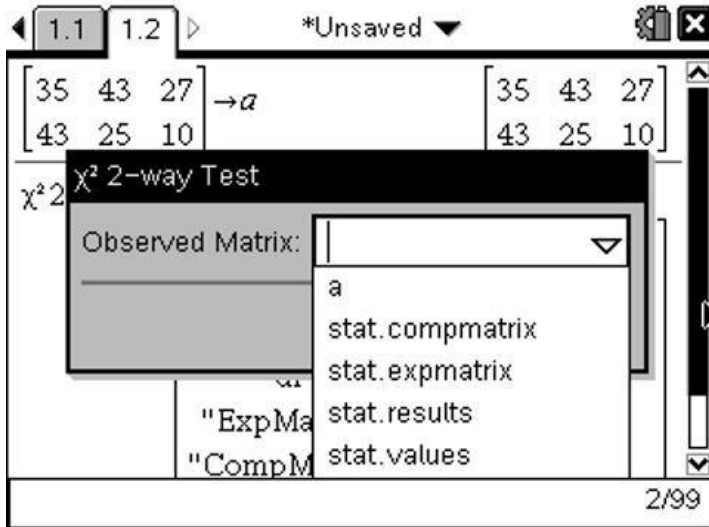
6: Statistics

7: stat tests

8: χ^2 -2-way Test

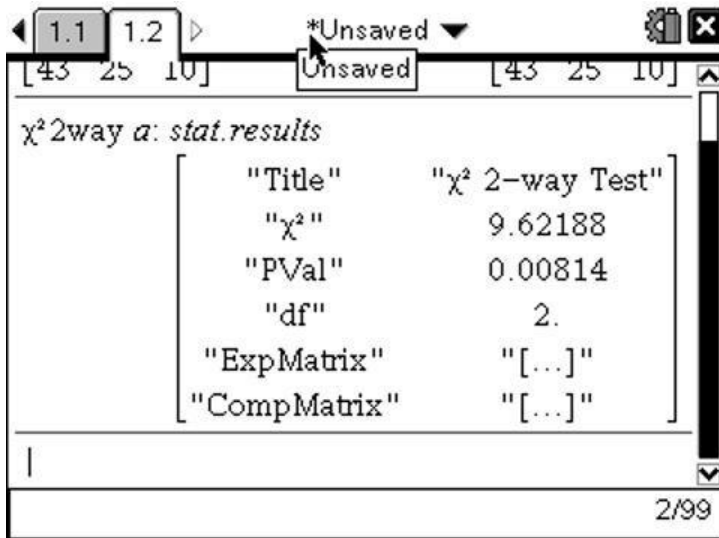
[Enter]

Choose the letter “a” or whatever you designated the matrix as for the “Observed Matrix:”



[OK]

You now have both χ^2 and you p value



Goodness of Fit 1 X

Put observed numbers in column a (and name)

Put expected number in column b (and name)

Expected can be either

1. Total divided by number of factors; You are saying that all factors will have equal amounts i.e. In the case of bags of M&M's you would be saying that there is an equal number of each color in each bag
2. A known statistic you are comparing your results to./ ie. We compare the number of M&M's, by color, in a sample of bags to the number of each color the company claims on its website.

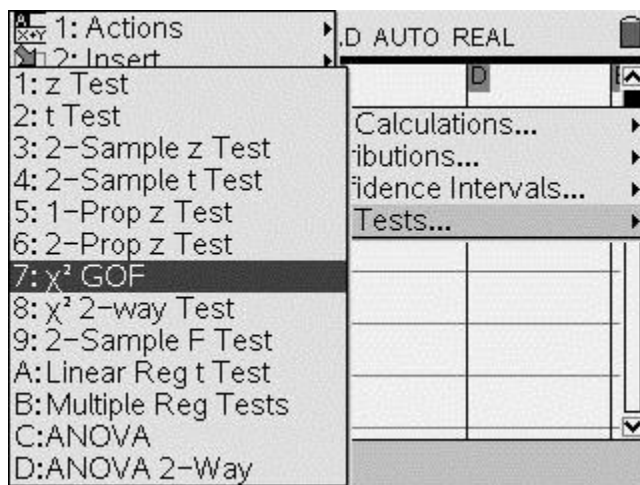
	A observ	B expec	C	D
1	5	5.5		
2	3	5.5		
3	7	5.5		
4	7	5.5		
5				

[Menu]

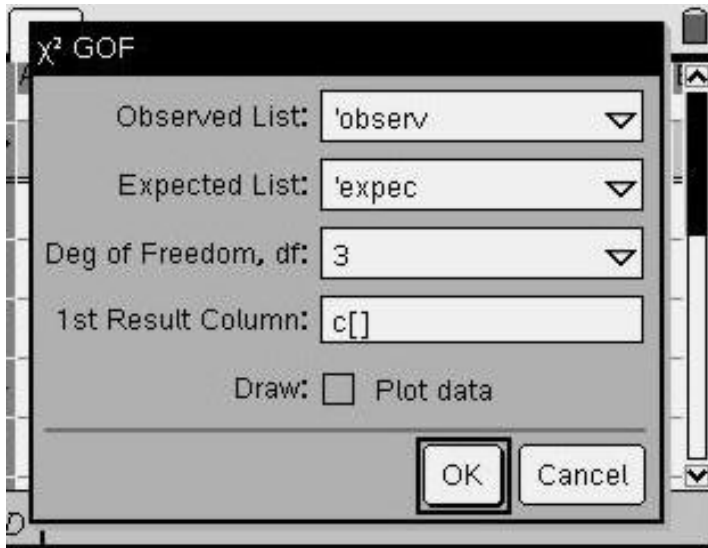
4: Statistics

4: Stat Tests

7: χ^2 GOF



[ENTER]



"Observed List" is the location of the list your survey found (in this case Column a

"Expected List" is the location of either
 1. Total / N
 2. Comparison data you are using

df = number of categories -1

The results gives us our χ^2 and probability

1.1 RAD AUTO REAL				
A	observ	B	expec	C
				D = χ^2 GOF('c
1	5	5.5	Title	χ^2 GOF
2	3	5.5	χ^2	2.
3	7	5.5	PVal	0.572407
4	7	5.5	df	3.
5			CompLis...	{0.04545...
D1	=" χ^2 GOF"			