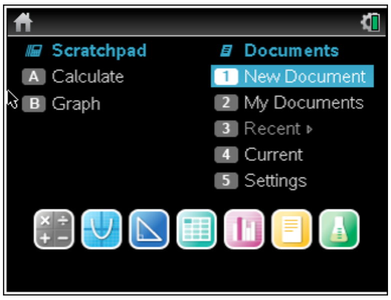
A P STATISTICS

TI-*nspire* CX

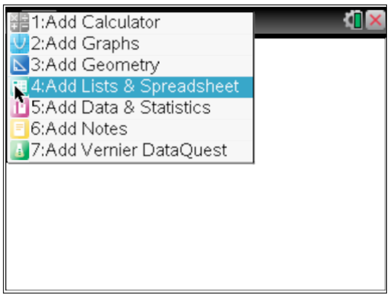
Calculator Skills

Mr. Fong / Mrs. Grogan Hong Kong International School 2012/13

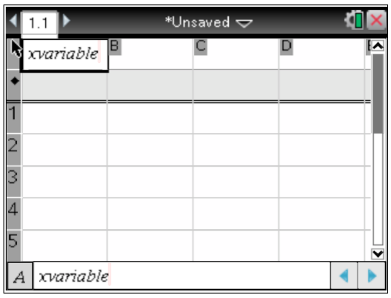
Entering Data Lists



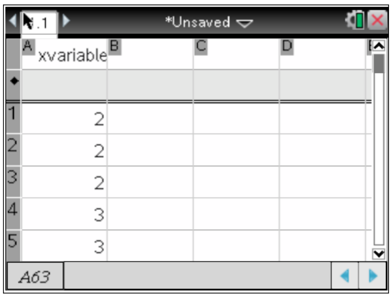
1. Open a New Document or use scratchpad 'A'



2. Add Lists & Spreadsheet

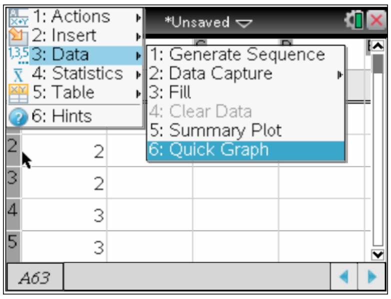


3. Name the data list. Use '*name*' for categorical data

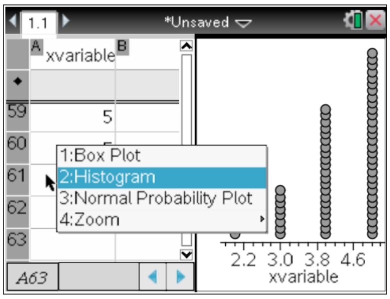


4. Input the data

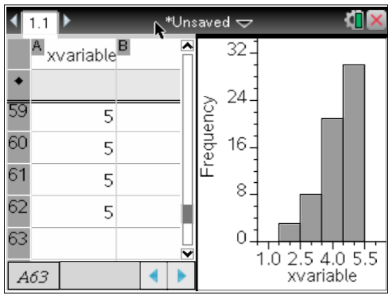
Creating a Single Histogram / Boxplot (Quantitative Data)



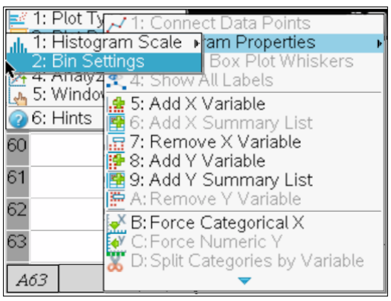
1. Menu: Data: Quick Graph



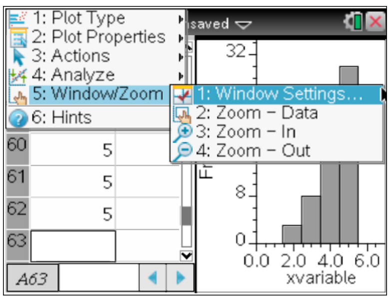
2. Right-click (Ctrl Menu): Histogram (Boxplot could be created at this stage)



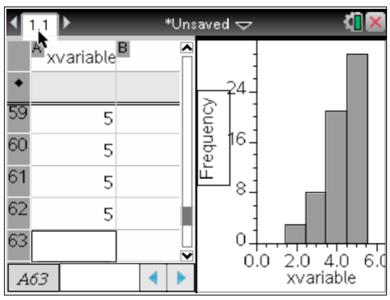
3. Adjust bin width by click and dragging a bar or..



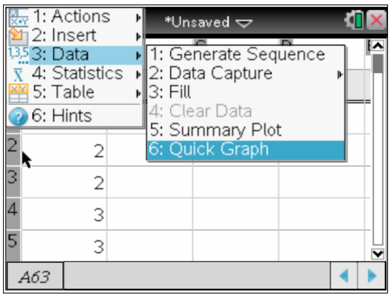
4. Click in graph: menu: Plot Properties: Histogram Properties: Bin Settings



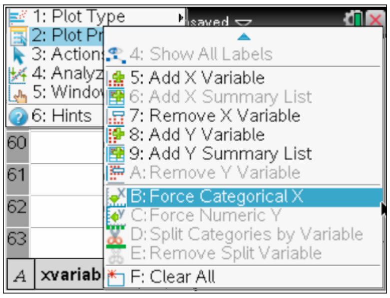
5. Adjust x-axis scale by clicking graph: menu: Window/Zoom



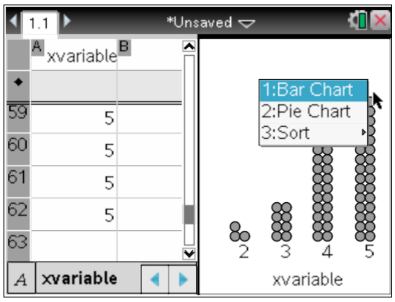
Creating a Single Bar Chart (Categorical Data)



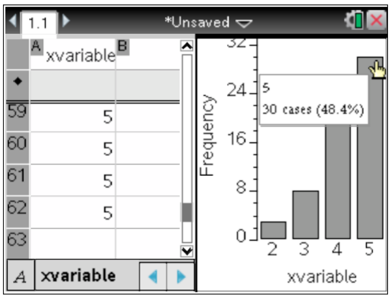
1. Menu: Data: Quick Graph



2. Menu: Plot Properties:
   Force Categorical X

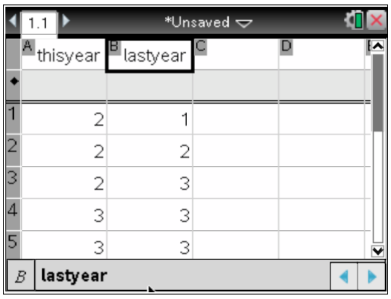


3. Click in graph: Right-click:
   Bar Chart

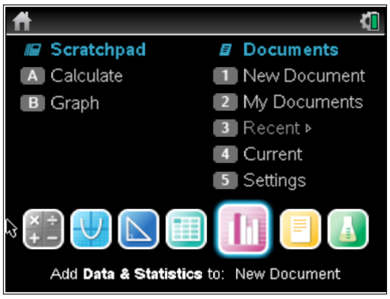


4. Trace over bars for details

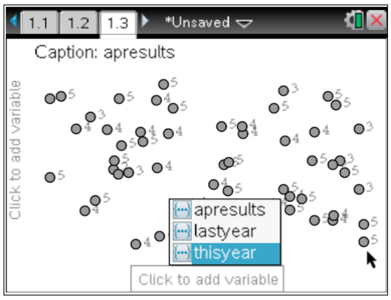
Creating Multiple Boxplots / Histograms



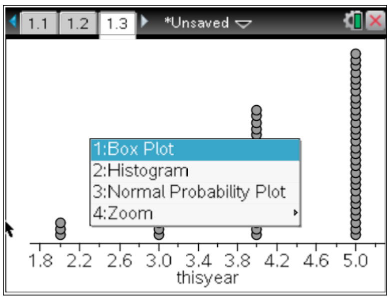
1. Begin with named data list(s)



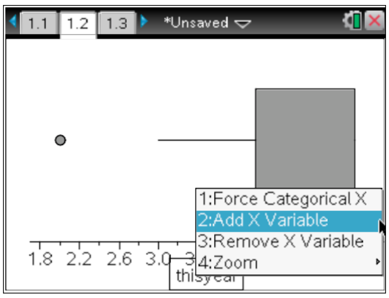
2. Home: Add Data & Stats



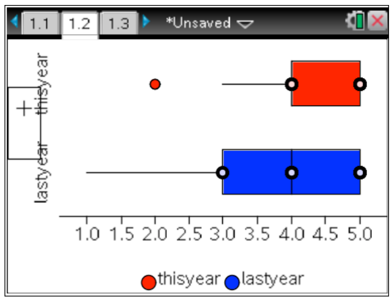
3. Click and add variable



4. Click in graph: Right click: Box Plot
   (Histogram could be created at this
   stage)

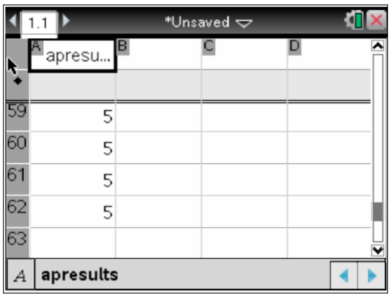


5. Click and add variable for more than
   one boxplot

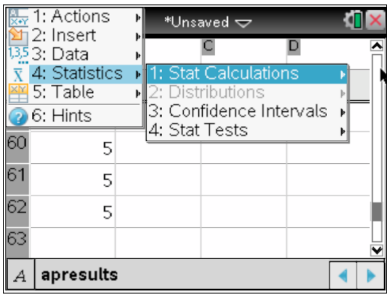


6. Color can be added by right-clicking
   in each boxplot

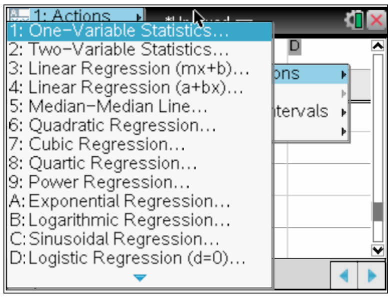
Obtaining Summary Statistics



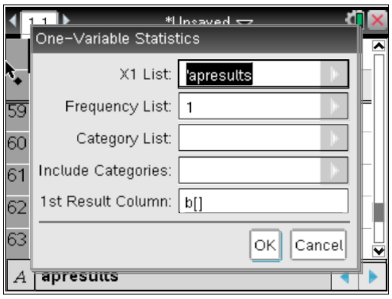
1. Begin with named data list



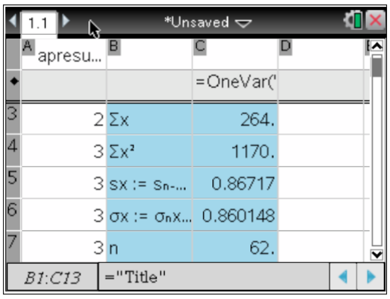
2. Menu: Statistics: Stats Calculations



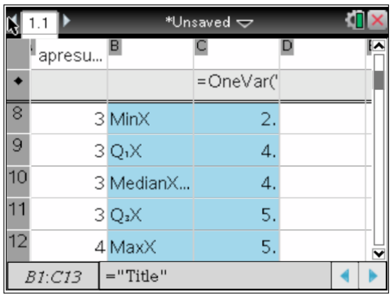
3. One-Variable Statistics



4. Choose list

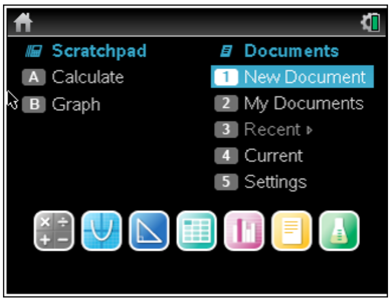


5. Scroll to top of list to view summary statistics

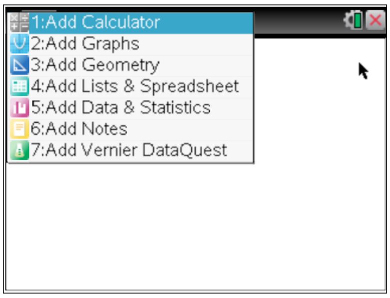


6. Scroll down list to view ‘5-number summary’

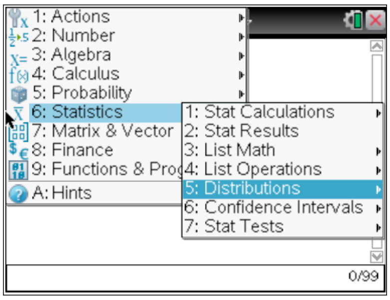
The Normal Distribution: Area Under A Normal Curve (Calculating Probability Between Two Boundaries)



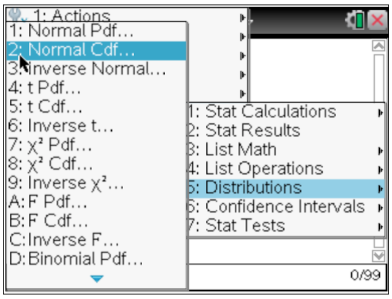
1. Open a New Document or use scratchpad ‘A’



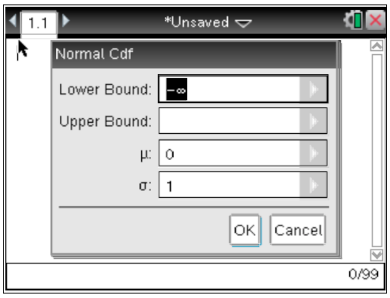
2. Add Calculator



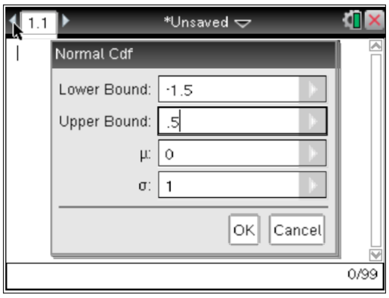
3. Menu: Statistics: Distributions



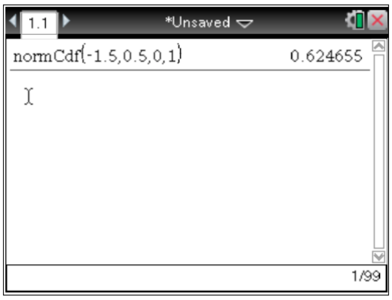
4. Normal CDf

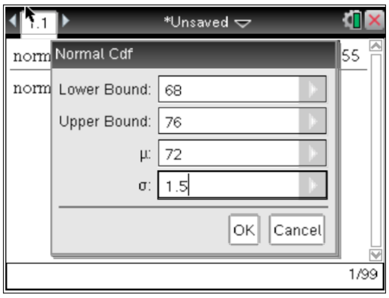


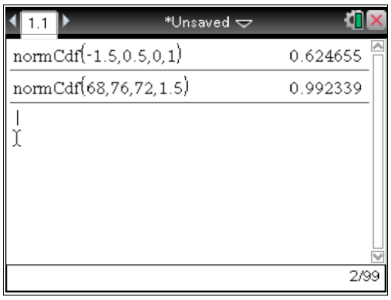
5. Enter Lower and Upper Bounds.



6. If using ‘z-scores’ leave μ = 0 and σ = 1



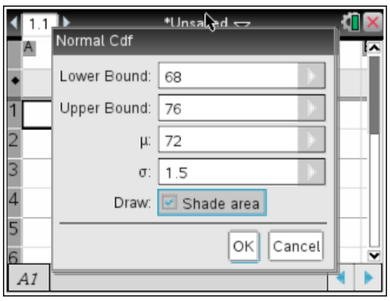


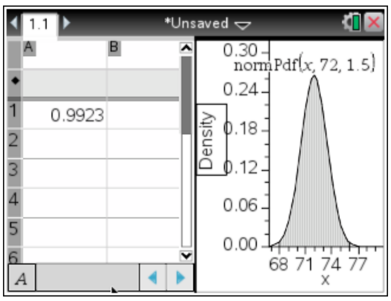


7. If calculating directly, input μ and σ

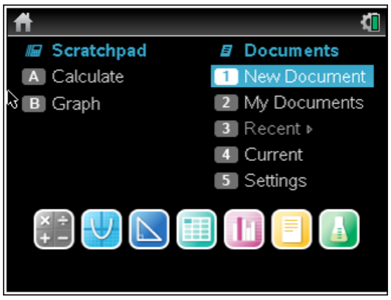
* **To obtain a graph** of the Distribution, perform the required calculation on a "List & Spreadsheets" page instead of a "Calculator" page.

Check the "Shade Area" box.

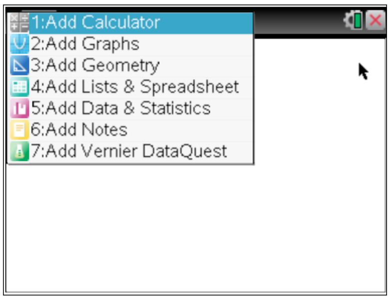




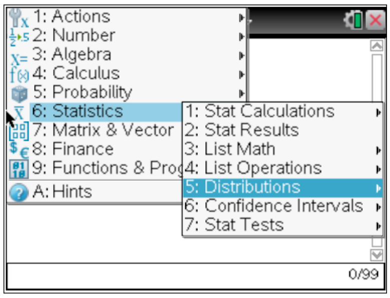
The Normal Distribution: Inverse Normal
(Calculating Percentiles Given Probability)



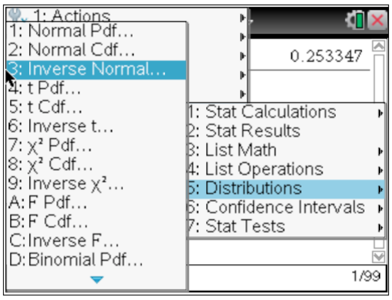
1. Open a New Document or use scratchpad 'A'



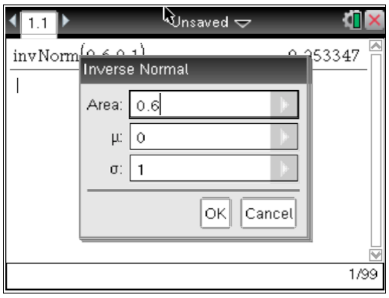
2. Add Calculator



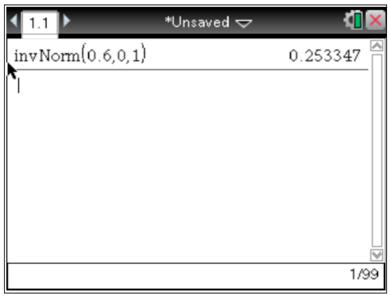
3. Menu: Statistics: Distributions



4. Inverse Normal

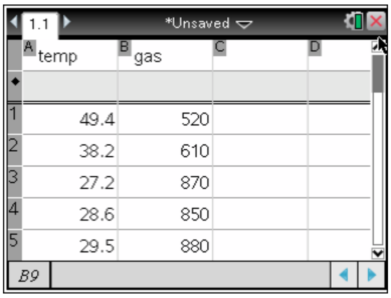


5. Enter Area (Probability) (and μ & σ if necessary)

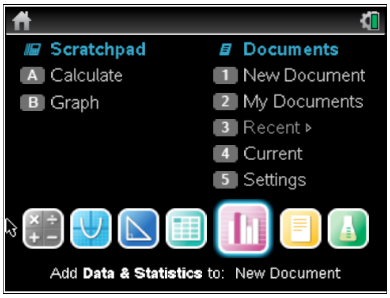


Note that **Area is always measured from the extreme left-hand side**.

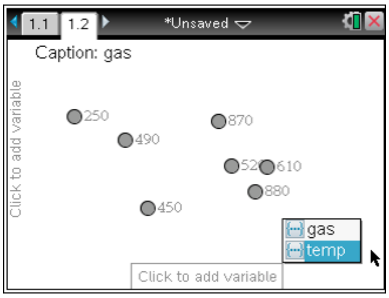
Bivariate Data: Producing a Scatter Plot



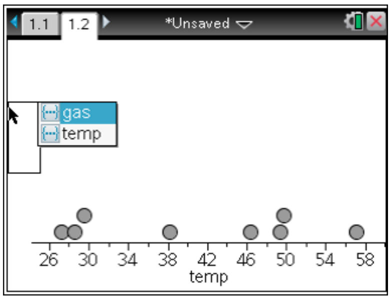
1. Begin with named data lists



2. Home: Add Data & Stats

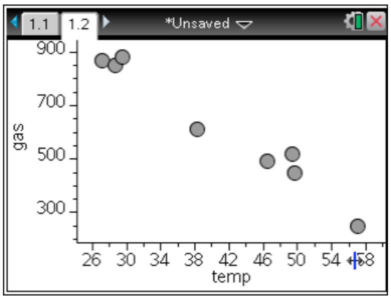


3. Click and add x-variable

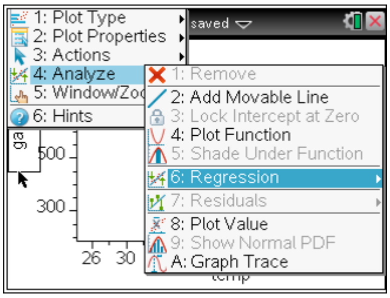


4. Click and add y-variable

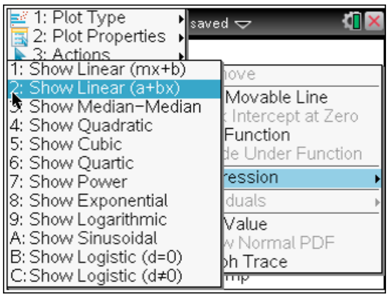
Bivariate Data: Graphing Least-Squares Regression Line



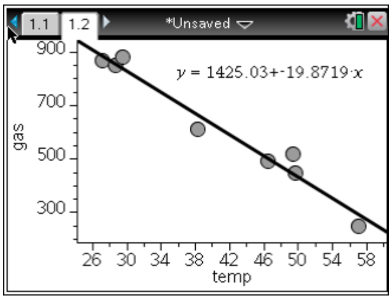
1. Begin with scatterplot



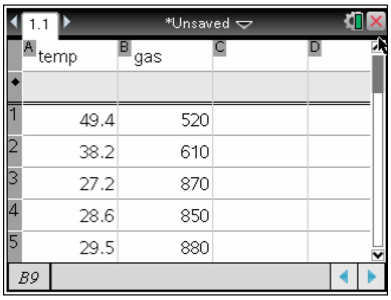
2. Menu: Analyze: Regression



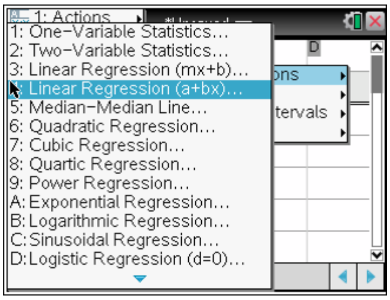
3. Show Linear (a+bx)



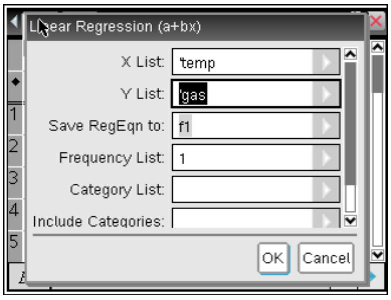
Bivariate Data: Linear Regression



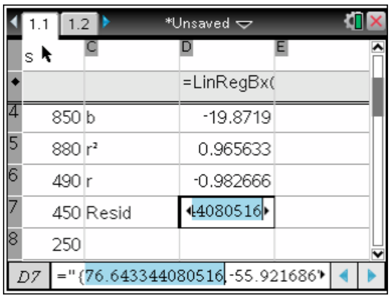
1. Begin with named data lists



2. Menu: Stat Calculations: Linear Regression (a+bx)

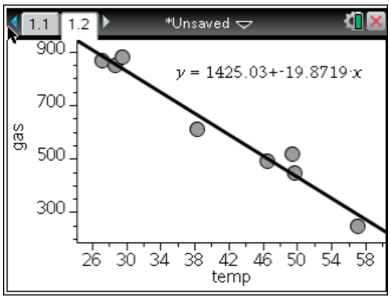


3. Enter appropriate x and y variables

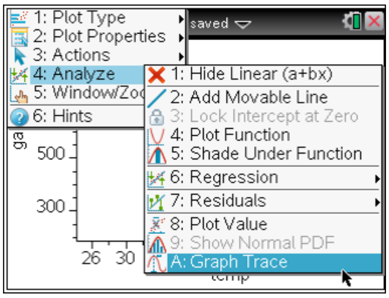


4. Scroll down to access r, r^2, and residuals

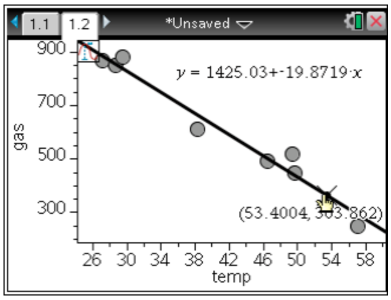
Bivariate Data: Interpolating Data



1. Begin with Scatterplot with linear regression

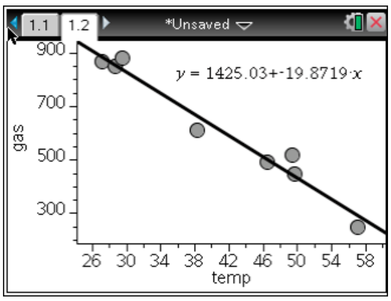


2. Menu: Analyze: Graph Trace

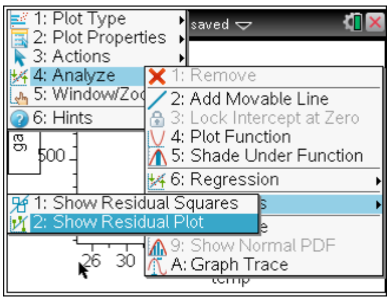


3. Move pointer along graph to interpolate

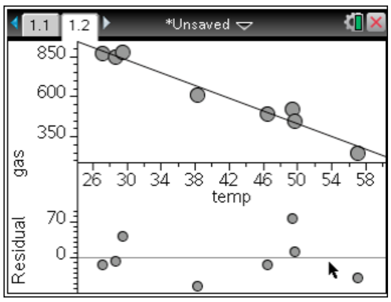
Bivariate Data: Producing a Residual Plot



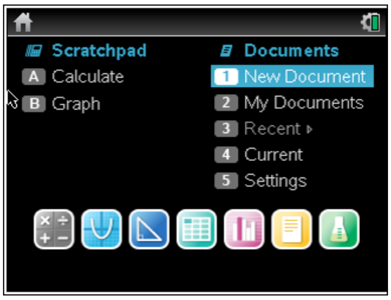
1. Begin with a Scatterplot with linear regression previously calculated on the 'Lists & Spreadsheets' page



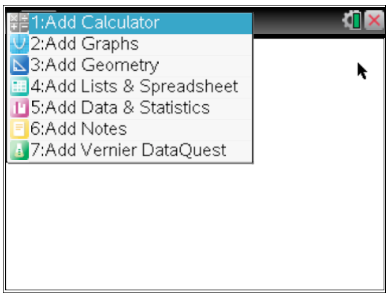
2. Menu: Analyze: Residuals: Show Residual Plot



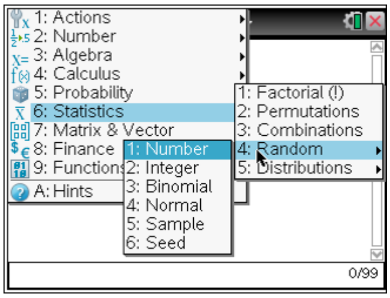
Generating Random Numbers



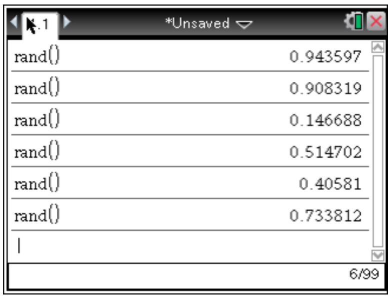
1. Open a New Document or use scratchpad 'A'



2. Add Calculator



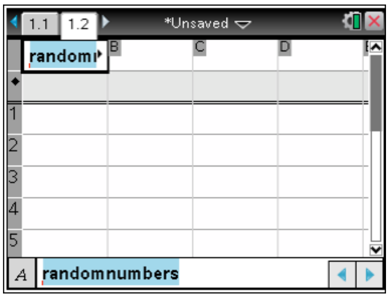
3. Menu: Statistics: Random Number: Enter



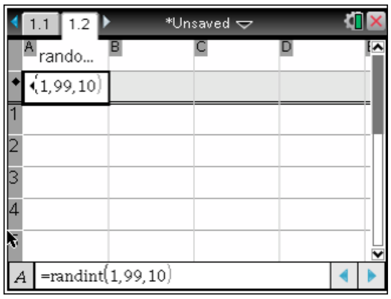
4. Repeat "Enter" for a new random number

Creating a List of Random Integers

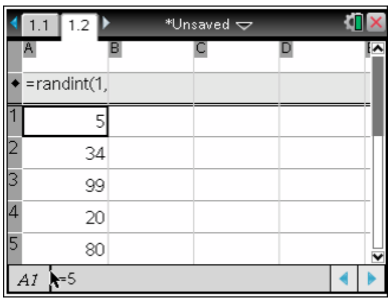
1. Home: Add Lists & Spreadsheet



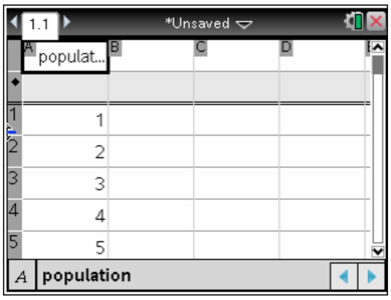
2. Name the data list.



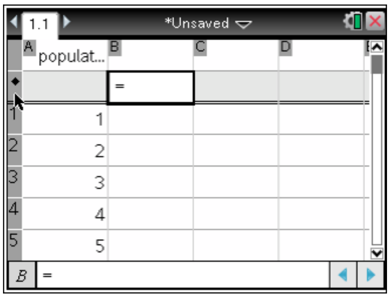
3. Type "=randint(*low*, *high*, *# of trials*)", then Enter



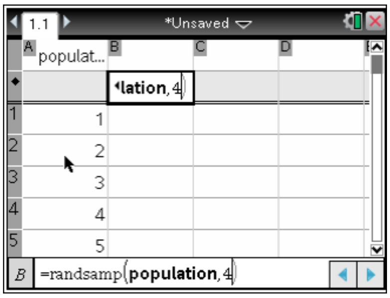
Creating a Random Sample From a List of Data



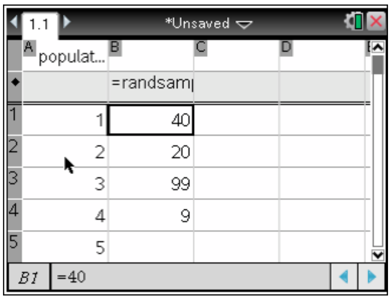
1. Begin with a named data list



2. Double click in the next list formula cell

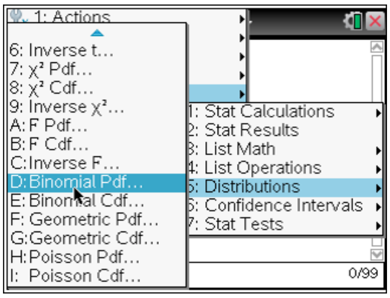


3. Type "=randsamp(*list*, *# of trials*)", then Enter

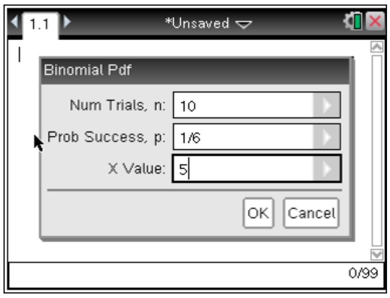


The Binomial Distribution: P(*x*) = k (Exactly k successes)

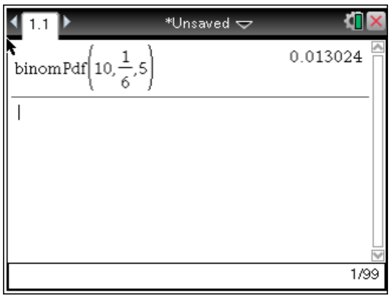
1. Home: Add Calculator



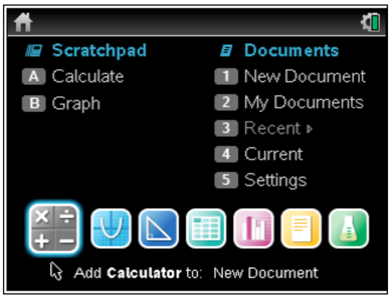
2. Menu: Probability: Distributions: BinomialPdf



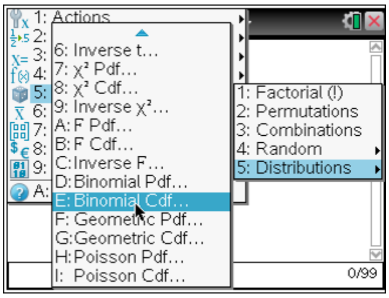
3. Input the appropriate values for problem



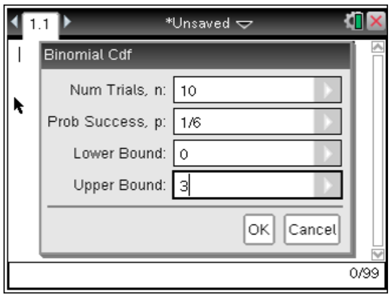
The Binomial Distribution: P(*x*) ≤ k (k or fewer successes)



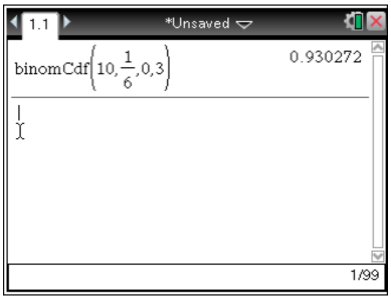
1. Home: Add Calculator



2. Menu: Probability: Distributions: BinomialCdf

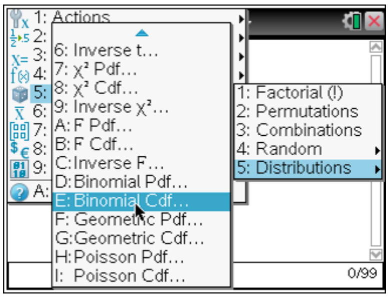


3. Input the appropriate values for problem (Lower bound = 0)

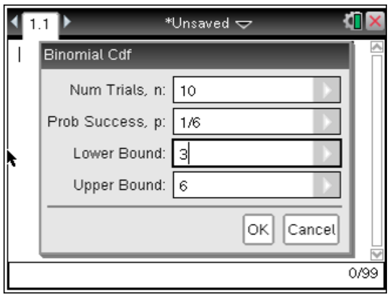


The Binomial Distribution: $k_{low} < P(x) \leq k_{high}$

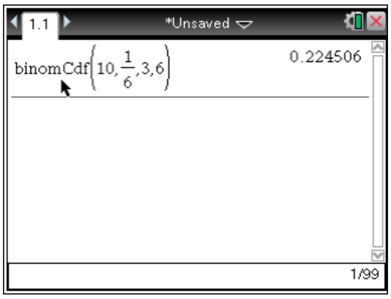
1. Home: Add Calculator



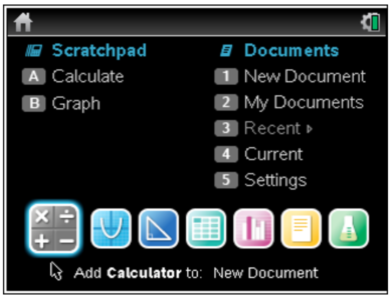
2. Menu: Probability: Distributions: BinomialCdf



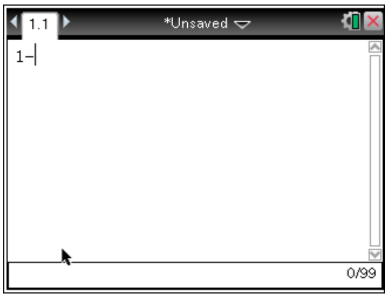
3. Input the appropriate values for problem



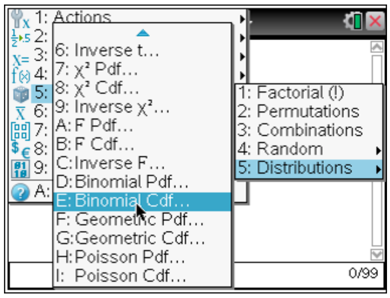
The Binomial Distribution: P(*x*) > k (More than k successes)



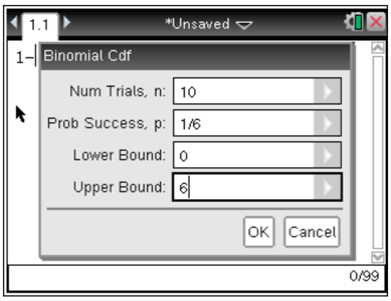
1. Home: Add Calculator

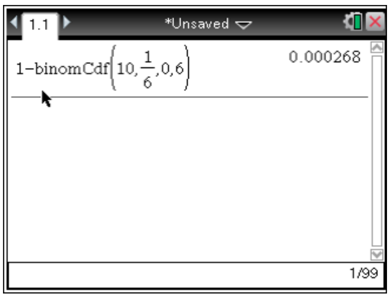


2. "1 - "



3. Menu: Probability: Distributions: BinomialCdf

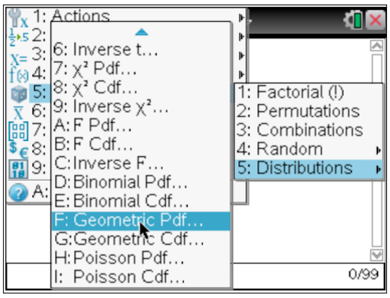




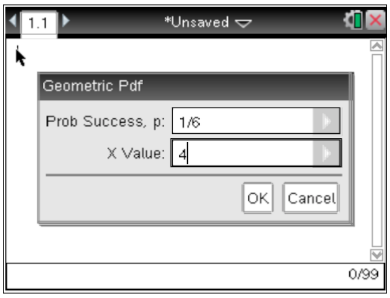
4. Input the appropriate values for problem (Lower bound = 0)

The Geometric Distribution: First Success on *n*th Trial

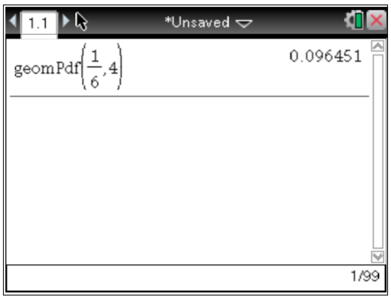
1. Home: Add Calculator



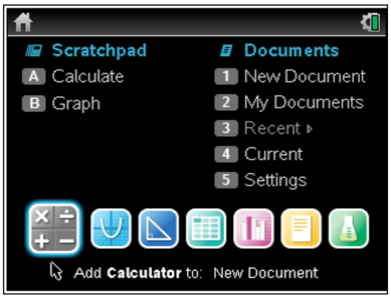
2. Menu: Probability: Distributions: GeometricPdf



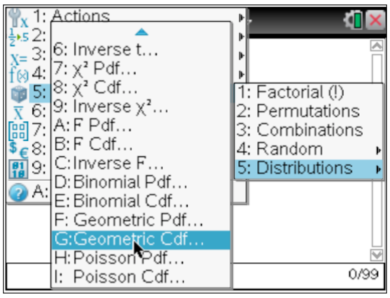
3. Input the appropriate values for problem



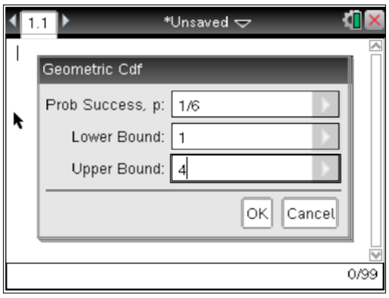
The Geometric Distribution: First Success On or Before *n*th Trial



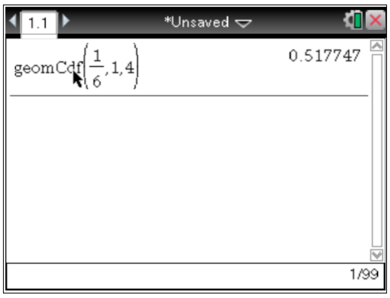
1. Home: Add Calculator



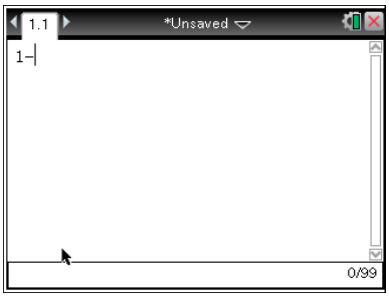
2. Menu: Probability: Distributions: GeometricCdf



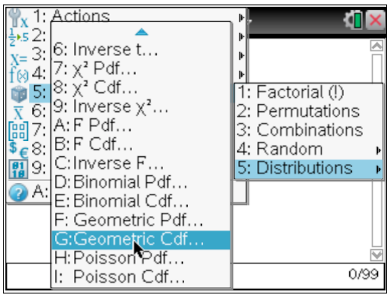
3. Input the appropriate values for problem



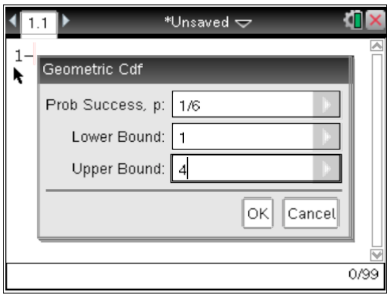
The Geometric Distribution: First Success After the *n*th Trial



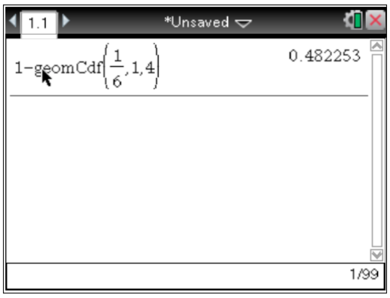
1. "1 - "



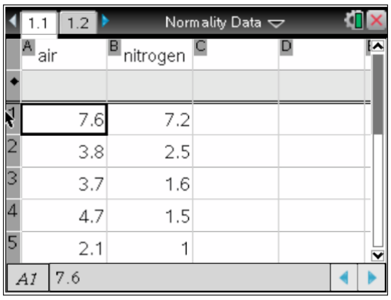
2. Menu: Probability: Distributions: GeometricCdf



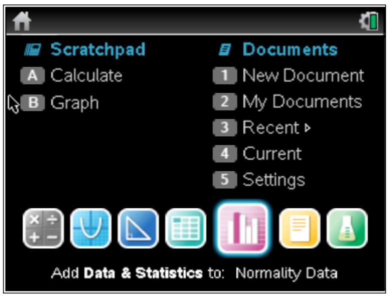
3. Input the appropriate values for problem



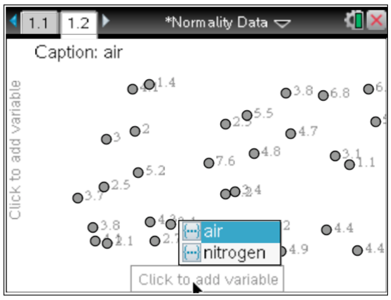
Assessing Normality of Data: Normal Probability Plot



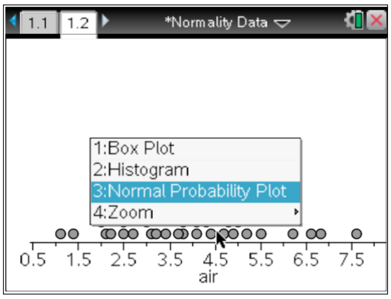
1. Begin with named data list

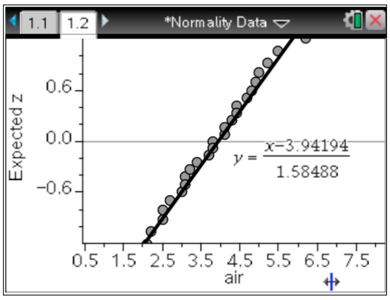


2. Home: Add Data & Statistics



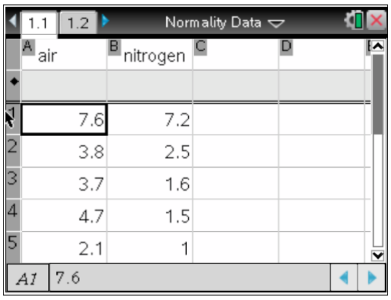
3. Click and choose variable



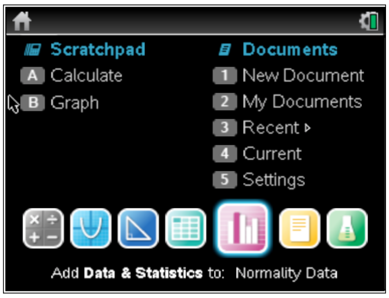


4. Right-click (Ctrl Menu): Normal Probability Plot

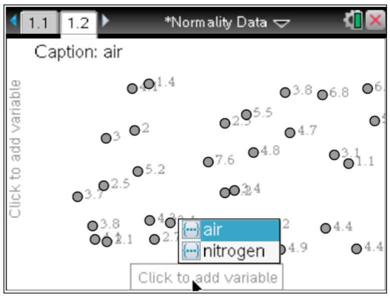
Assessing Normality of Data:
Comparing Histogram with Normal Probability Density Function



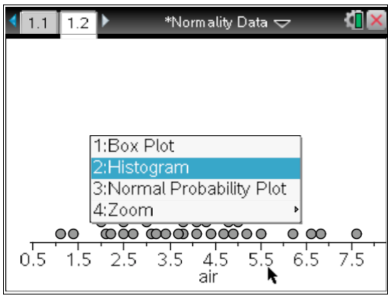
1. Begin with named data list



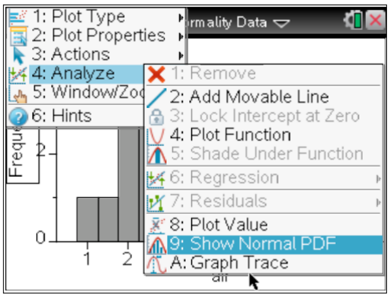
2. Home: Add Data & Statistics



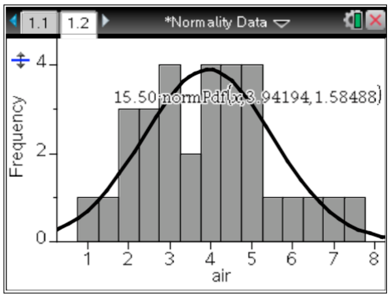
3. Click and choose variable



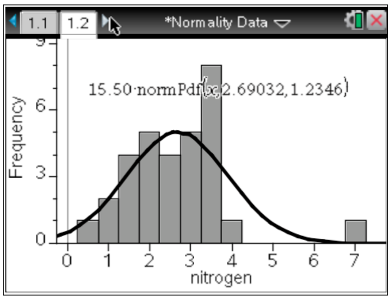
4. Right-click (Ctrl Menu):Histogram



5. Menu: Analyze: Show Normal PDF



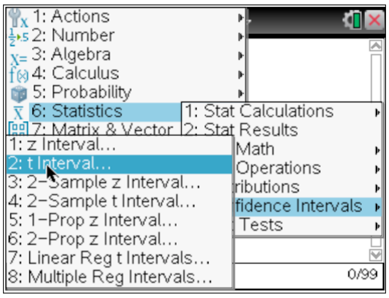
6. Overlays a normal prob. density curve based on $\bar{x}$ and s for the given data



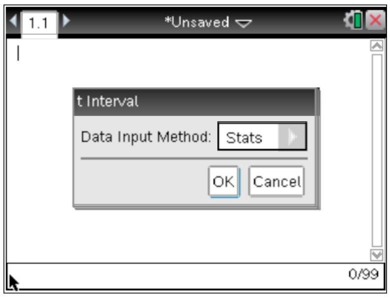
Comparison can be made to assess how 'normal' the data may be

Confidence Interval For Population Mean: (Known Statistics)

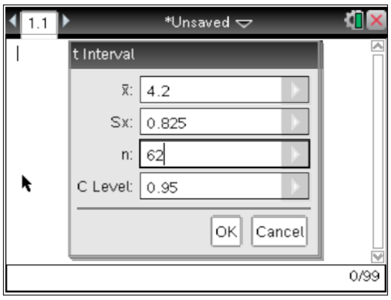
1. Home: Add Calculator: or use scratchpad 'A'



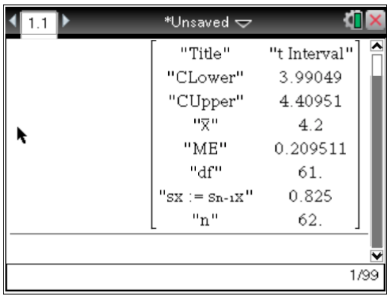
2. Menu: Statistics: Confidence Intervals: t Interval



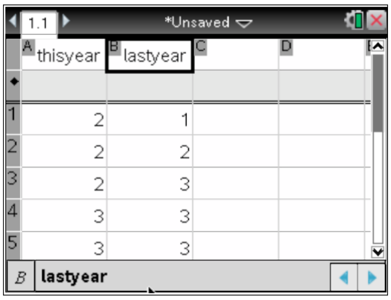
3. Choose 'Stats' as Data Input Method



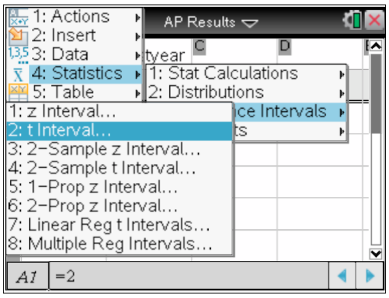
4. Enter the appropriate statistics for the problem



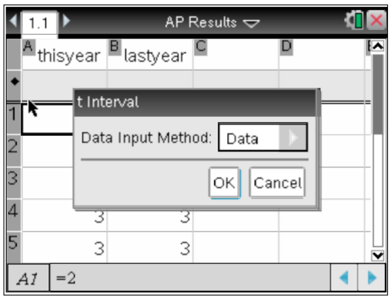
Confidence Interval For Population Mean: (From Original Data)



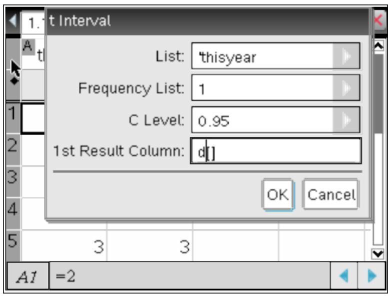
1. Home: Add Calculator: or use scratchpad 'A'



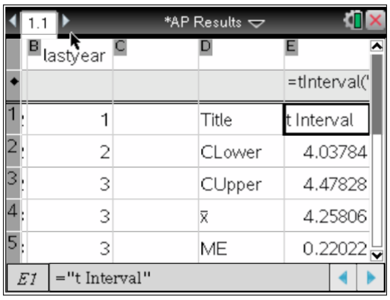
2. Menu: Statistics: Confidence Intervals: t Interval



3. Choose 'Data' as Data Input Method

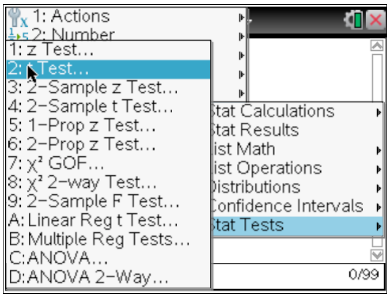


4. Enter the appropriate information for the problem

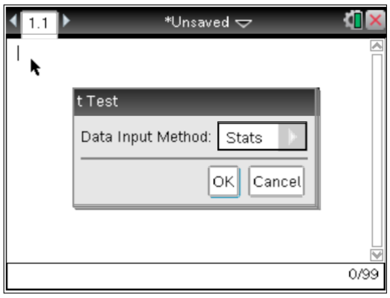


Significance Test For Population Mean: (Known Statistics)

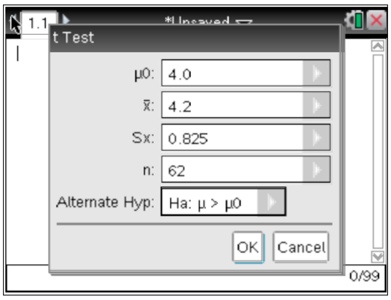
1. Home: Add Calculator: or use scratchpad 'A'



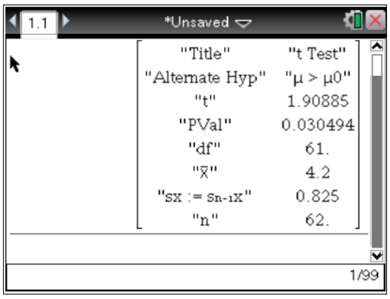
2. Menu: Statistics: Stat Tests: t Test



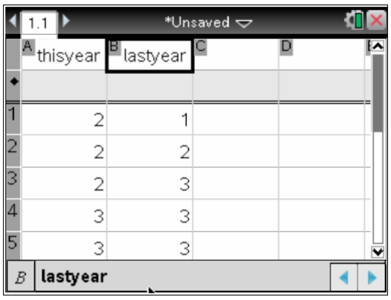
3. Choose 'Stats' as Data Input Method



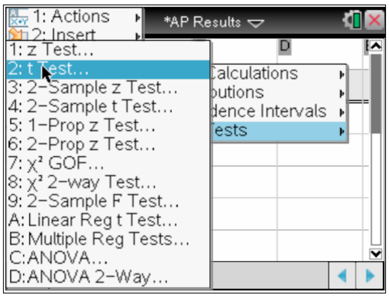
4. Enter the appropriate statistics for the problem



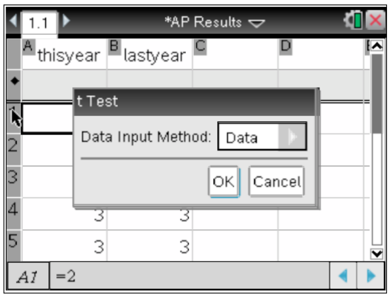
Significance Test For Population Mean: (From Original Data)



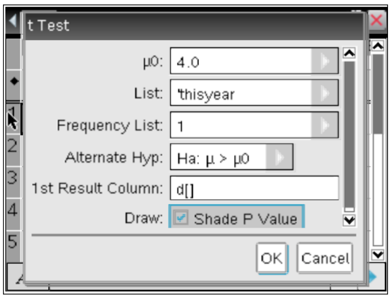
1. Begin with named list(s)

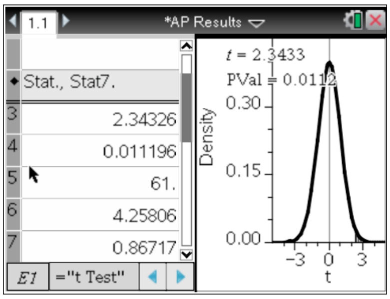


2. Menu: Statistics: Stat Tests: t Test



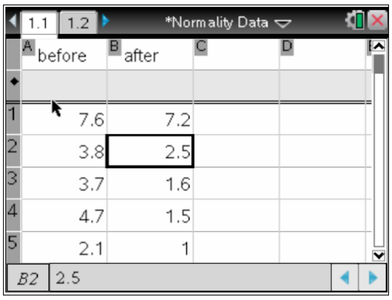
3. Choose 'Data' as Data Input Method





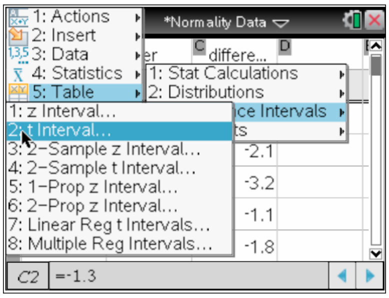
4. Enter the appropriate information.
(Click 'Shade P Value' to obtain a graph)

‘Matched Pairs’: “Mean Difference” Confidence Interval

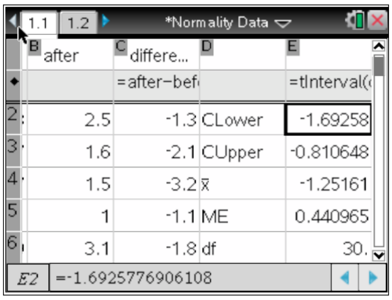


1. Begin with named list(s)

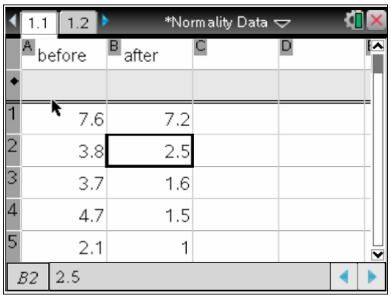
2. Compute a third list for the **differences**



3. Proceed with a ***1-Sample t Interval*** for the **differences**

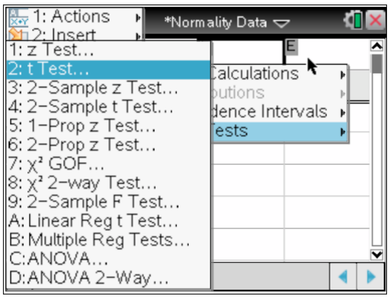


‘Matched Pairs’: “Mean Difference” Significance Test

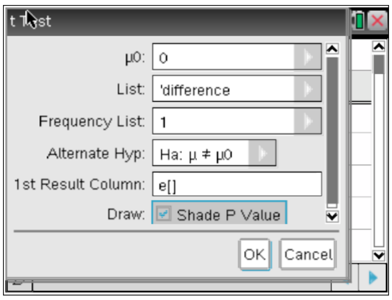


1. Begin with named list(s)

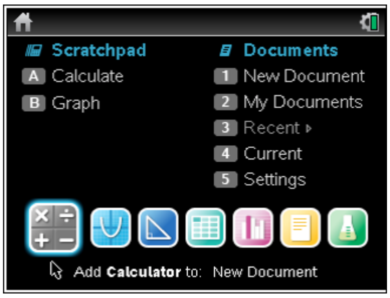
2. Compute a third list for the **differences**



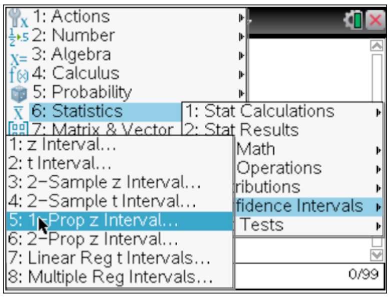
3. Proceed with a ***1-Sample t Test*** for the **differences**



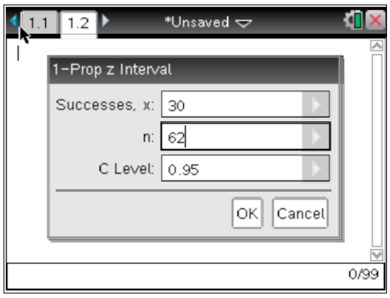
Confidence Interval For Proportions:



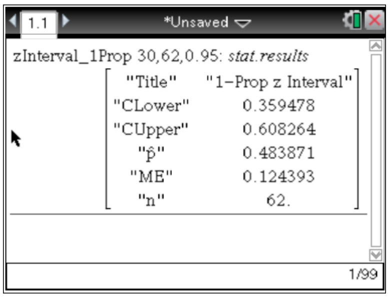
1. Home: Add Calculator: or use scratchpad 'A'



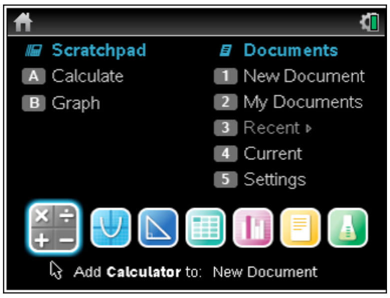
2. Menu: Statistics: Confidence Intervals: 1-Prop z Interval



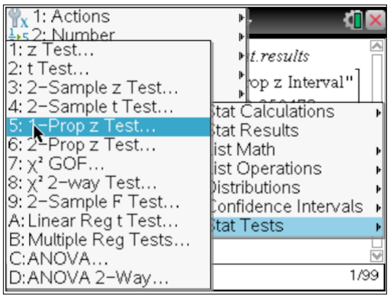
3. Enter the appropriate information for the problem



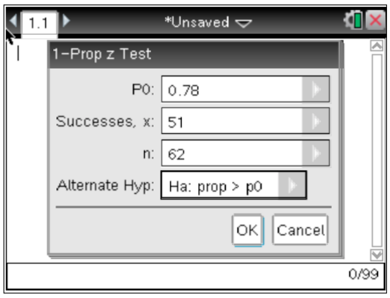
Significance Test For Proportions:



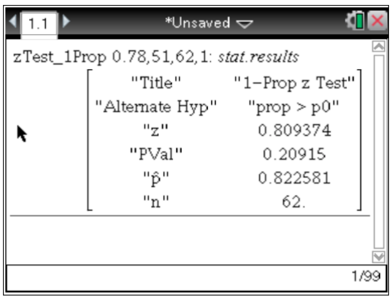
1. Home: Add Calculator: or use scratchpad 'A'



2. Menu: Statistics: Stat Tests: 1-Prop z Test

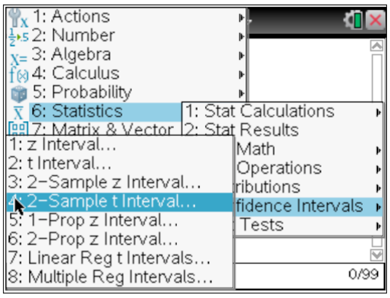


3. Enter the appropriate information for the problem

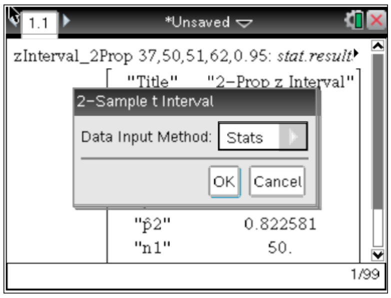


Difference of Two Means: Confidence Interval (Known Statistics)

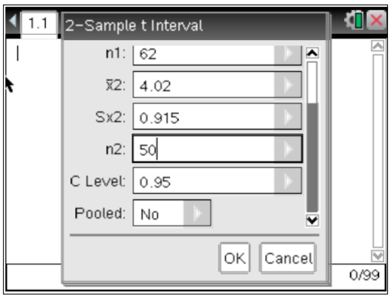
1. Home: Add Calculator: or use scratchpad 'A'



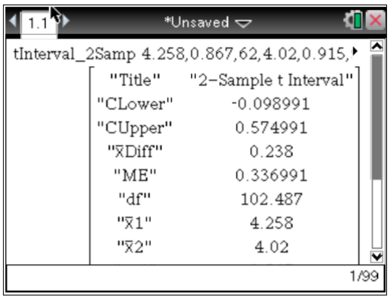
2. Menu: Statistics: Confidence Intervals: 2-Sample t Interval



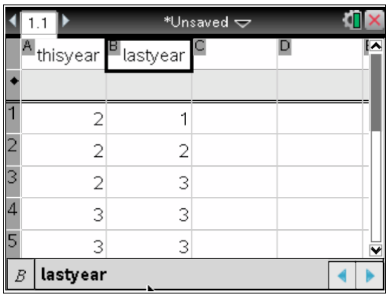
3. Choose 'Stats' as Data Input Method



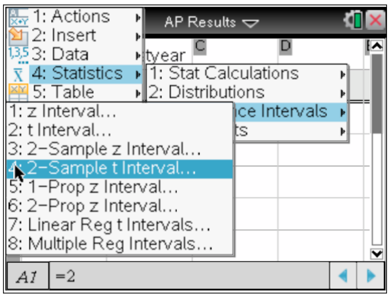
4. Enter the appropriate information for the problem



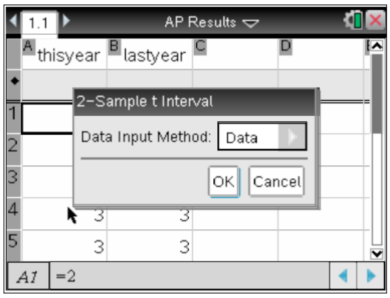
Difference of Two Means: Confidence Interval (From Original Data)



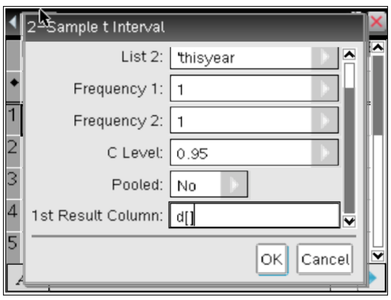
1. Home: Add Calculator: or use scratchpad 'A'



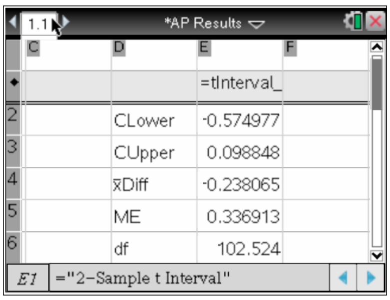
2. Menu: Statistics: Confidence Intervals: 2-Sample t Interval



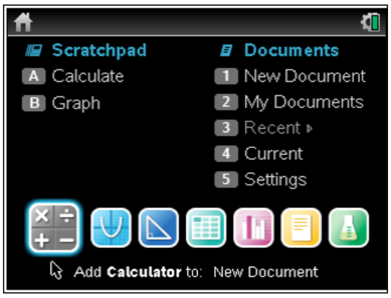
3. Choose 'Data' as Data Input Method



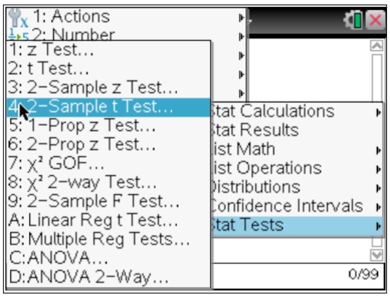
4. Enter the appropriate information for the problem



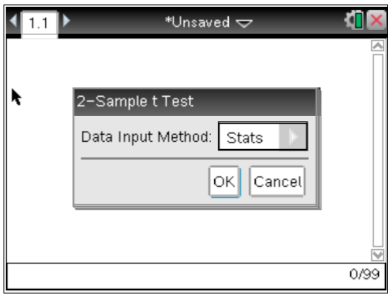
Difference of Two Means: Significance Test (Known Statistics)



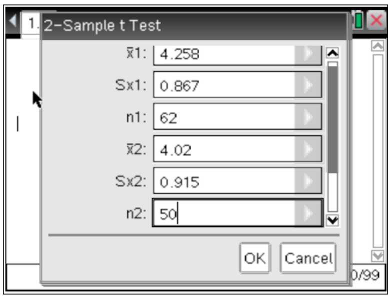
1. Home: Add Calculator: or use scratchpad 'A'



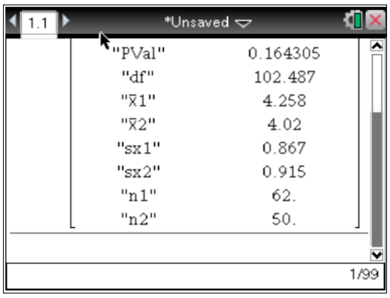
2. Menu: Statistics: Stat Tests: 2-Sample t Test



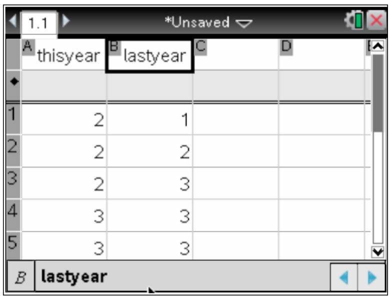
3. Choose 'stats' as Data Input Method



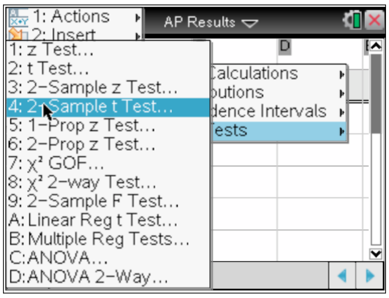
4. Enter the appropriate information for the problem



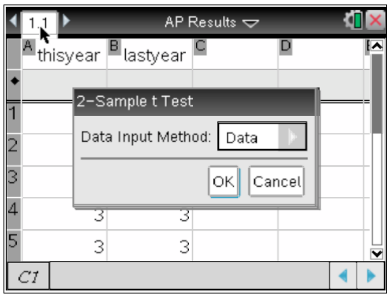
Difference of Two Means: Significance Test (From Original Data)



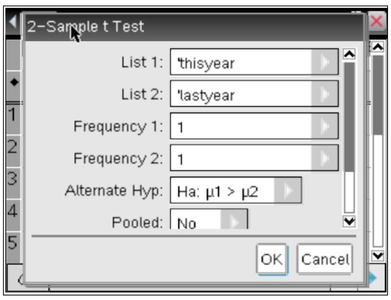
1. Home: Add Calculator: or use scratchpad 'A'



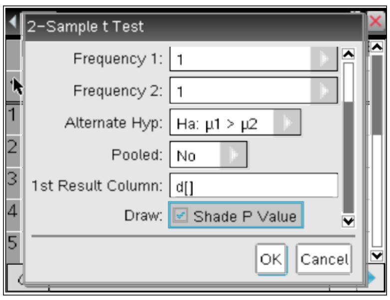
2. Menu: Statistics: Stat Tests: 2-Sample t Test



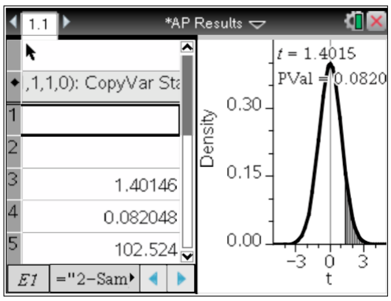
3. Choose 'Data' as Data Input Method



4. Enter the appropriate information for the problem

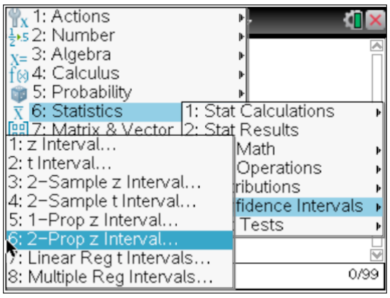


5. Click 'Shade P Value' to obtain a graph

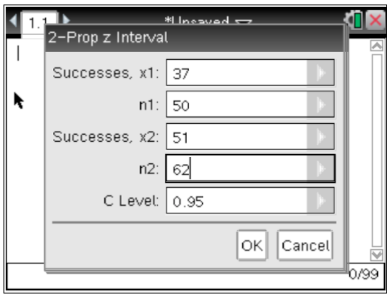


Comparing Two Proportions: Confidence Interval

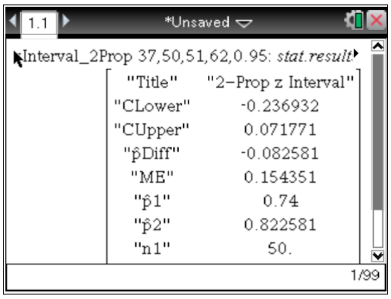
1. Home: Add Calculator: or use scratchpad 'A'



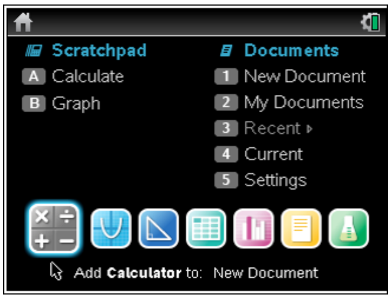
2. Menu: Statistics: Confidence Intervals: 2-Prop z Interval



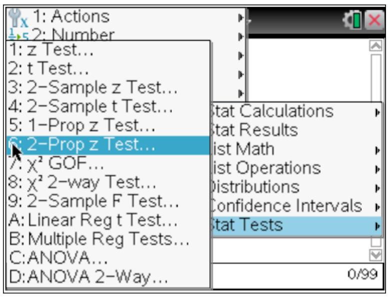
3. Enter the appropriate information for the problem



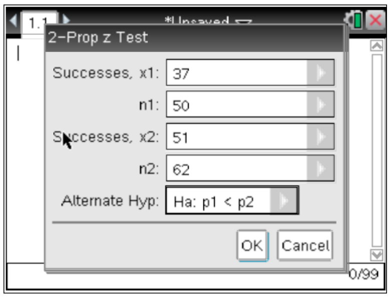
Comparing Two Proportions: Significance Test



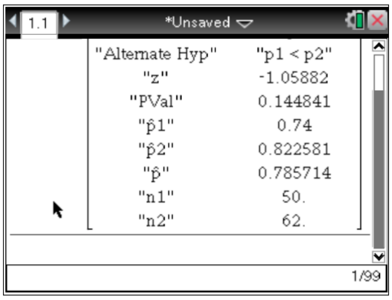
1. Home: Add Calculator: or use scratchpad 'A'



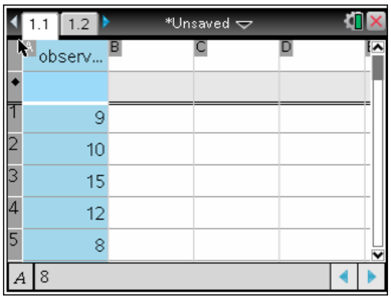
2. Menu: Statistics: Stat Tests: 2-Prop z Test



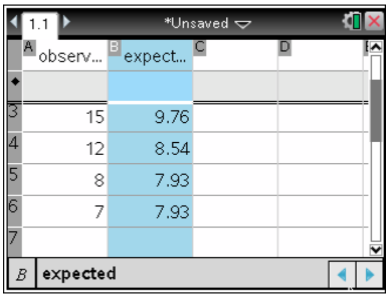
3. Enter the appropriate information for the problem



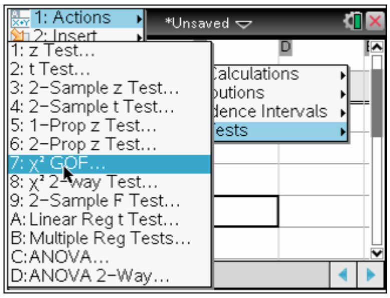
The Chi-Squared Distribution: Goodness Of Fit Test



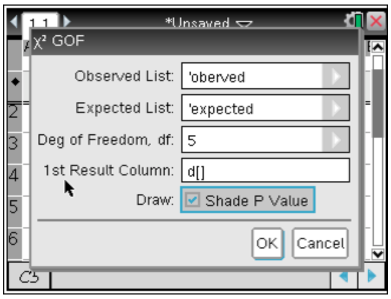
1. Begin with a list of observed counts



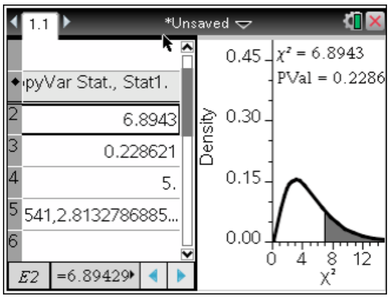
2. Calculate the expected counts and enter as a list



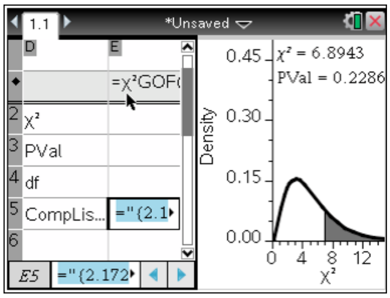
3. Menu: Statistics: Stat Tests: χ^2 GOF:



4. Enter list names, degrees of freedom. (Check 'Shade P Value' if you want obtain a graph)

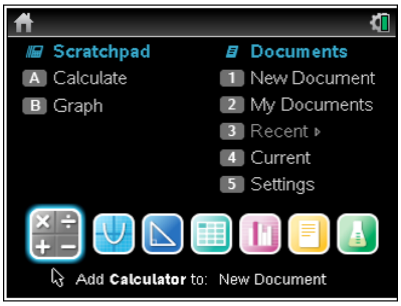


5. Scroll down results column to see χ^2 value and p-value

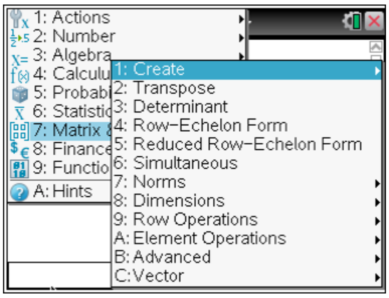


6. Scroll across the component list for 'follow-up analysis'

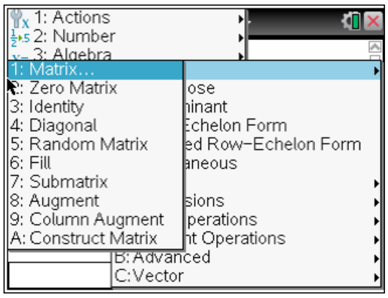
The Chi-Squared Distribution: Two-Way Table



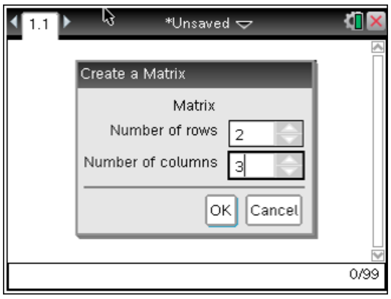
1. Home: Add Calculator: or use scratchpad 'A'



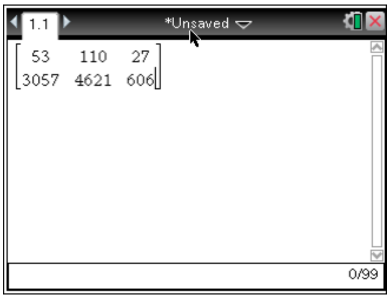
2. Menu: Matrix & Vector: Create

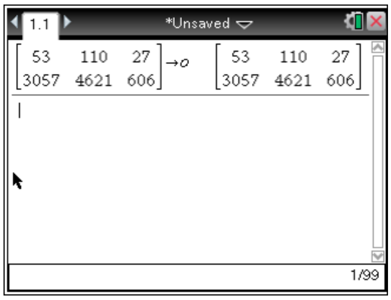


3. Matrix

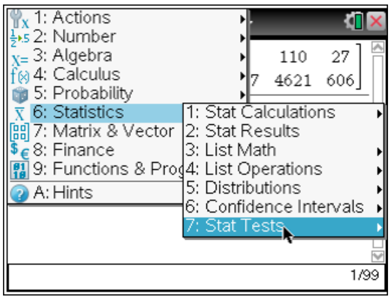


4. Enter the matrix size

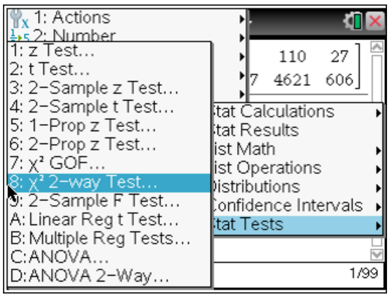




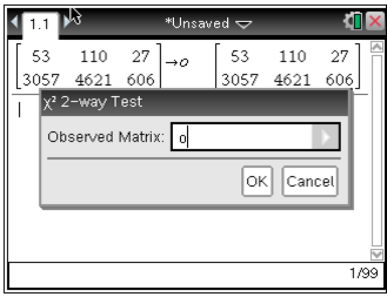
5. Sto → (Ctrl Var): *'matrix name'*



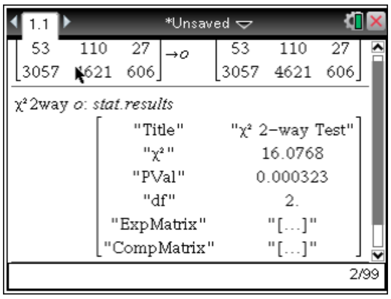
6. Menu: Statistics: Stat Tests

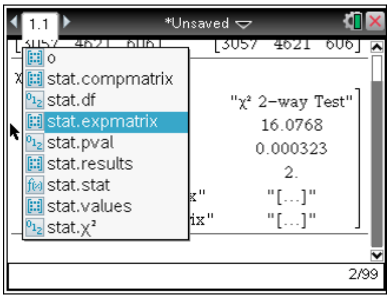


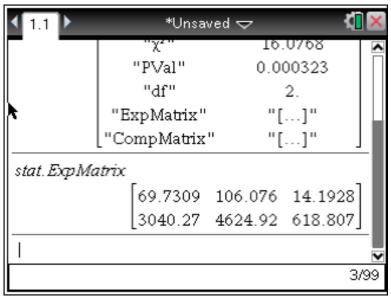
7. χ^2 2-way Test



8. Enter *'matrix name'*

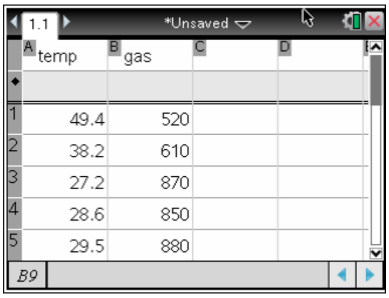




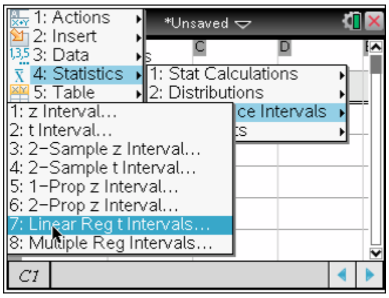


9. Var: stat.expmatrix: Enter: to obtain expected values
(Var: stat.compmatrix: to obtain components of χ^2-test statistic for follow-up analysis)

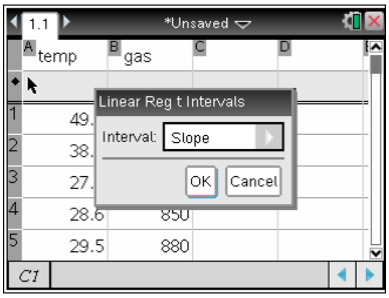
Confidence Interval For Regression:

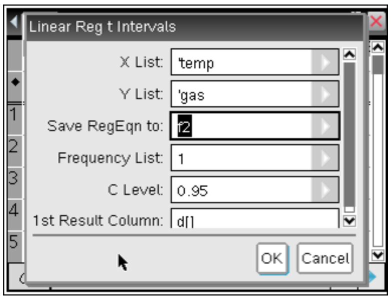


1. Begin with named data lists

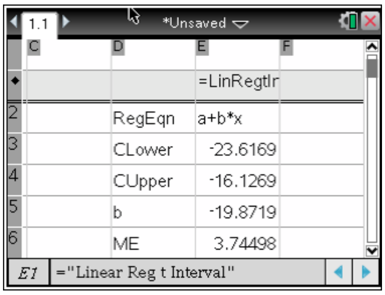


2. Menu: Statistics: Confidence Intervals: Linear Reg t Intervals

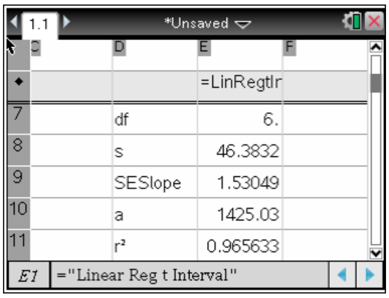


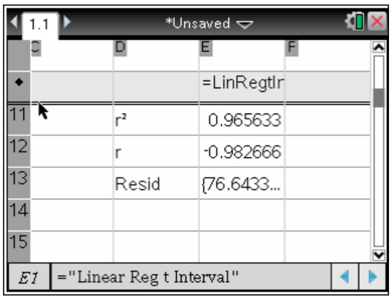


3. Enter the appropriate information for the problem

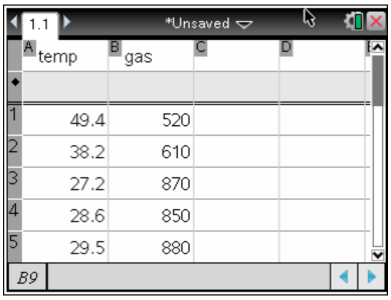


4. Scroll down list for further results

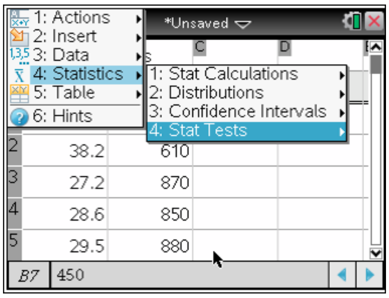




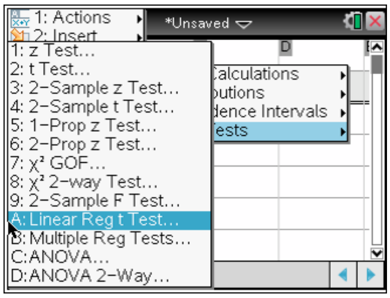
Significance Test For Regression:



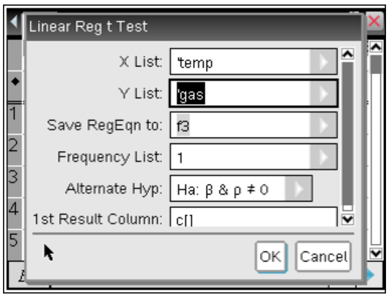
1. Begin with named data lists



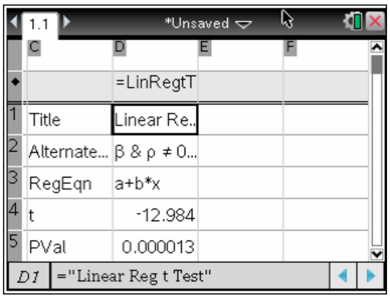
2. Menu: Statistics:
Confidence Intervals:



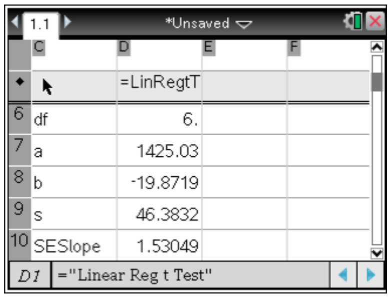
3. Linear Reg t Test

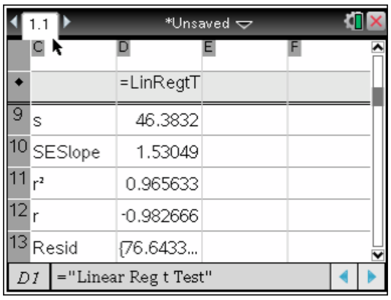


4. Enter the appropriate information for the problem



5. Scroll down list for further results





Notes…