TI Technology Guide for Is leisure time really shrinking?

TI-83 Plus and TI-84 Plus Families

Creating Lists of Data, Displaying the Graph, Using the Regression Capabilities of the Calculator, Finding the Intersection Between Graphs, and Finding the Maximum of a Graph

Creating Lists of Data
To enter the data from the Snapshot in the activity, press   and select 1:Edit to access the List Editor window. Be sure to clear any existing data in the lists by highlighting the list name and pressing ⊆. If you see a list other than L1 through L6, press and select   5:SetUpEditor ⊆and then follow the above instructions.

Move the cursor to the first data position in L1 and enter the years from the USA TODAY Snapshot "Is leisure time really shrinking". Move the cursor to the first data position in L2 and enter the corresponding median number of hours per week Americans say they spend on work. Move the cursor to the first data position in L3 and enter the corresponding median number of hours Americans say they spend on leisure per week.

Move the cursor to the top of L4 and press ψ ε ≠ ψφ⊆. The numbers in L4 represent the difference between consecutive entries in L2 and L3.

The numbers in L4 represent the difference between median hours at work per week and median hours spent on leisure per week.
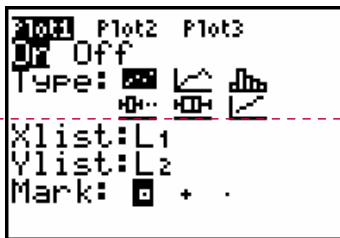
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Displaying the Graph
Access the STAT PLOTS menu screen by pressing ψ
o. Select (press ⊆or the number 1) 1:Plot1 to get the
screen shown. Make the changes needed, so that
Plot1 has the same settings as shown at the right.

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Move the cursor to Plot2 at the top of the screen and
press ⊆. Repeat the procedure above for Plot2 with
the settings shown at the right.
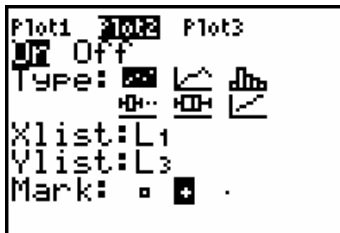
To insure that all the data points are visible, press π
and enter values for the x-axis and y-axis that contain
the range of values from both sets of data shown in
the graphic (see suggested values at the right).
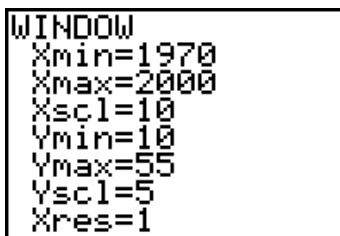
Press oand clear any equations listed. Press σ to view
both scatter plots. Years (L1) are on the horizontal
axis, and the number of hours per week that
Americans say they spend on work(L2) and the
number of hours per week that Americans say they
spend on leisure (L3) consumption are on the vertical
axis. Press ρand use the |or ~keys to read the values
of the data points. Use the }or to move between the
scatter plots.
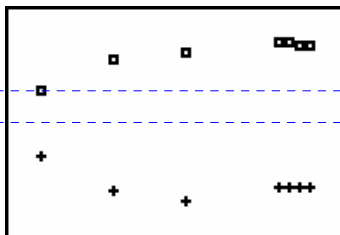
> **Deleted:** red meat

> **Deleted:** poultry
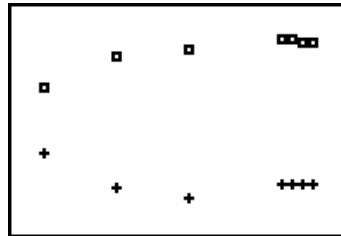
Another way to set the window for a scatter plot is to
press θ →. This will select 9:ZoomStat which will
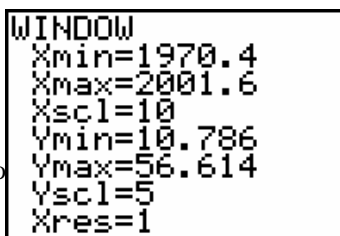
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automatically set the viewing window and display all the data points from both scatter
plots.

Using the Regression Capabilities of the Calculutor

To turn off the diagnostic tools of r (correlation
coefficient) and r^2 (coefficient of determination),
press ψND then press   until you locate
DiagnosticOff.

```
CATALOG          ▣
 ▶Dec
  Degree
  DelVar
  DependAsk
  DependAuto
  det(
 ▶DiagnosticOff
```
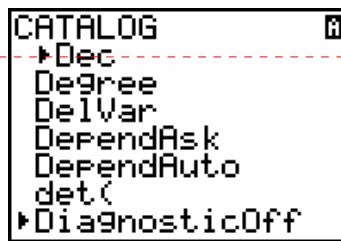
Formatted: Superscript

Press ⊂⊂. If you want to activate the diagnostic tools
of r and r^2 repeat the above procedure but select
DiagnosticOn.

```
DiagnosticOff
             Done
■
```
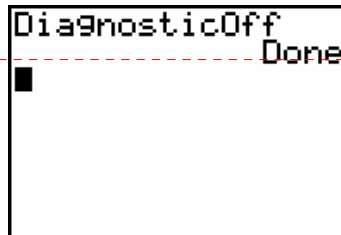
Formatted: Superscript

To use the regression capabilities, press   ~ to access
the CALC menu. The regression models are 3
through C and the arguments for each regression

```
QuadReg L₁,L₂,Y₁
```

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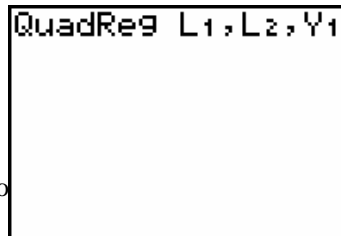
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model are the same. To use the quadratic regression model select 5:QuadReg from the STAT CALC menu and enter $\psi\delta'\psi\epsilon'$ ~⊆⊆ to include all arguments shown in the screen shot. These commands will calculate the best fit model for the scatter plot of L1 and L2 and then paste the model in the Y= register in Y1.

Press ⊆to calculate the quadratic function that best models the data set.

```
QuadReg
 y=ax²+bx+c
 a=-.0215805616
 b=86.07511991
 c=-85778.0992
 R²=.9837199368
 ■
```

Repeat the above procedure to determine the quadratic model for the other scatter plot of L1 and L3 with the regression equation being put in Y2.
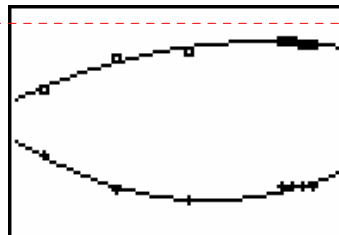
```
QuadReg L₁,L₃,Y₂
■
```

```
QuadReg
 y=ax²+bx+c
 a=.0372051594
 b=-147.9909782
 c=147182.5855
 R²=.9641703193
 ■
```

Press σ. The regression lines and the scatter plots are displayed simultaneously.

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Press o to view the functions. Notice that Plot 1 is highlighted, which indicates that the data points for L1 and L2 are showing on the graph. The = beside Y1 is also highlighted, which indicates that the function determined by the regression capabilities is also showing on the graph. Pressing ⊂ when the cursor is in either of these highlighted areas acts as a toggle to turn on or off the display of that component on the graph.

Press π and make the change shown in the screen shot at the right. The change is necessary so that the intersection of the two curves is in the graphing screen.

Press σ to see both functions and scatter plots.
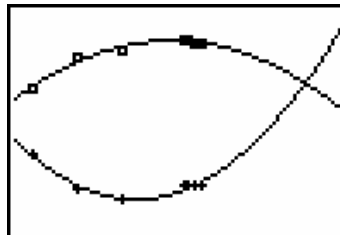
Finding the Intersection between Graphs

Press ψ / and select 5:intersect. At the bottom of the screen the prompt appears identifying the curves that intersect. Use the up or down arrow keys to switch between the curves. Press ⊂ when prompted to identify the First curve.
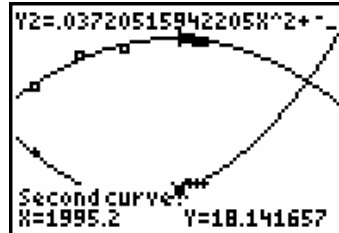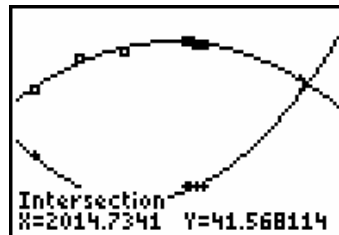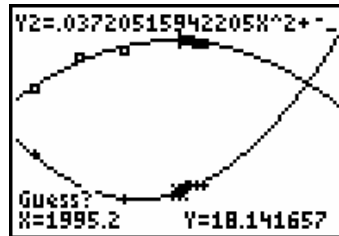
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Press ⊆again when prompted to identify the Second curve. Notice that the cursor has jumped to the other curve and the equation has changed in the upper left-hand corner.
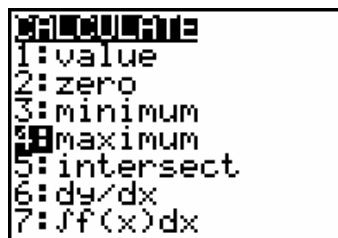
When prompted to Guess, use the right or left arrow keys to place the cursor near the point of intersection that you are trying to find, then press ⊆. If there were more than two curves use the up or down arrow to move the cursor to the curve you want to use before pressing ENTER. The coordinates of the intersection are displayed at the bottom of the screen

Finding the Maximum of a Graph

Press ψ / and choose 4:maximum. If there are multiple graphs use the arrow keys(}) so that the cursor is on the model where the maximum is located.
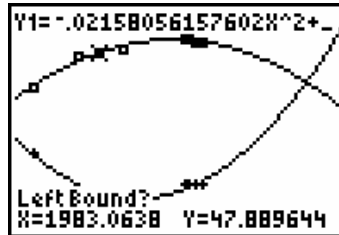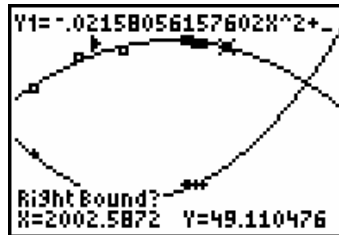
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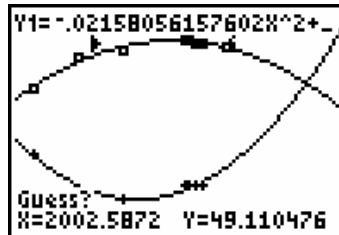
Use the arrow keys(~|) to move the cursor so that it is to the left of the maximum value of the graph and press ⊆.
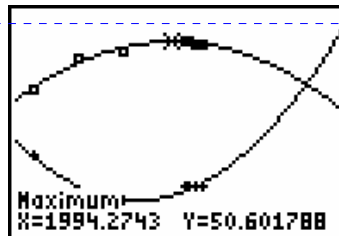
Continue to pressing ~ until the cursor is on the right side of the maximum value of the graph and press ⊆.

When prompted to Guess, use the right or left arrow keys to place the cursor near the point representing the maximum that you are trying to find.

Press ⊆ and the maximum point will be shown at the bottom of the screen.

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