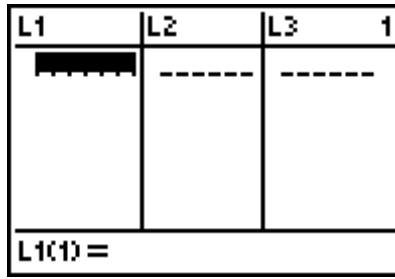
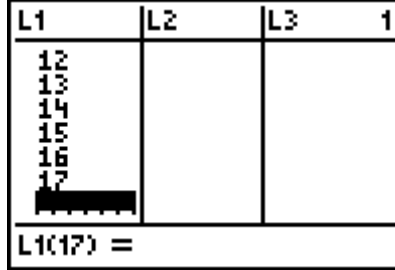


This example asks you to create a quadratic function that models the number of Starbucks stores in the United States for the years 1992 through 2007, using the number of years after 1990 as the input x .

Year	Starbucks Stores	Year	Starbucks Stores
1992	113	2000	2119
1993	163	2001	2925
1994	264	2002	3756
1995	430	2003	4453
1996	663	2004	5452
1997	974	2005	6423
1998	1321	2006	7715
1999	1657	2007	9401

To find a quadratic model of this data, we need to align the data by subtracting 1990 from each of the years. Using these aligned inputs, we'll create a scatter plot and the corresponding quadratic model. This will be done with the help of your graphing calculator.

<p>Enter the data</p> <ol style="list-style-type: none"> To enter the data, press [STAT]. Under the EDIT menu, press 1 or highlight 1: Edit... to enter the statistics editor. 	
<ol style="list-style-type: none"> In the first column, enter the aligned data for the years after 1990. After each row, press [↓] or [ENTER] to go to the next line. The data in the column are referred to as list 1 or L_1. After the last year, press [▶] to go to the second column. 	

5. In the second column, enter the number of Starbucks stores followed by \downarrow or ENTER to go to the next row. The data in the column are referred to as list 2 or L_2 .

L1	L2	L3	Z
2			
3			
4			
5			
6			
7			
8			

L2(1)=

6. After you have entered all of the numbers, check to insure that each year has a corresponding number of stores. To the right, you'll notice that each column has the same number of data. If the numbers of data in the columns don't match, you'll get an error when you graph the scatter plot.

L1	L2	L3	Z
12	3756		
13	4453		
14	5452		
15	6423		
16	7715		
17	8401		
-----	-----		

L2(17) =

Set up the scatter plot

7. Press WINDOW .
 8. To accommodate the data we just entered, modify the window so it appears like the one to the right.

```

WINDOW
Xmin=0
Xmax=18
Xscl=2
Ymin=0
Ymax=10000
Yscl=2000
Xres=1
  
```

9. Now we need to turn on the scatter plot. Press 2nd|Y= to enter the STAT PLOT menu. There are three statistical plots on your calculator that you can plot your data on. To select Plot 1, press ENTER .

```

STAT PLOTS
1 Plot1...Off
  L1 L2
2 Plot2...Off
  L1 1
3 Plot3...Off
  L1 L4
4 PlotsOff
  
```

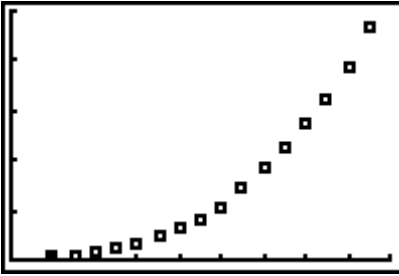
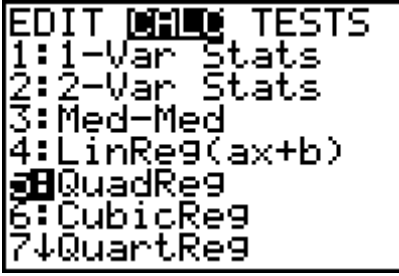

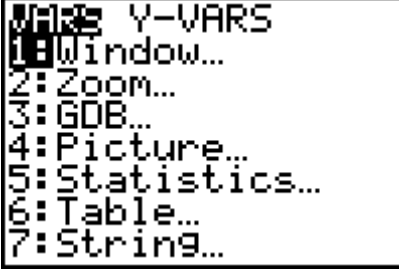
10. In the Plot 1 menu, move your cursor around this menu using \leftarrow , \uparrow , \rightarrow , and \downarrow . Make sure that Plot 1 is turned on by pressing ENTER when the cursor is over On.

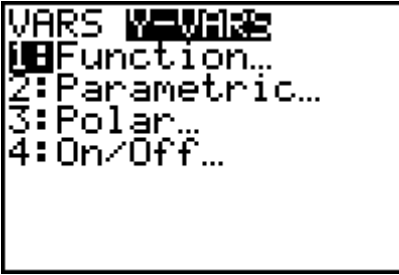

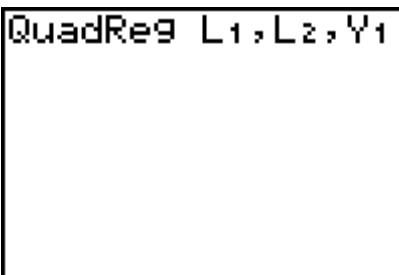
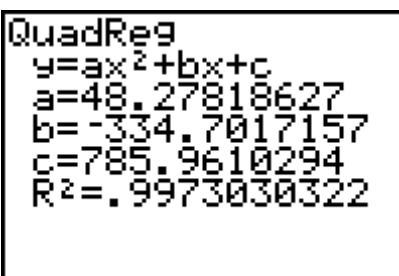
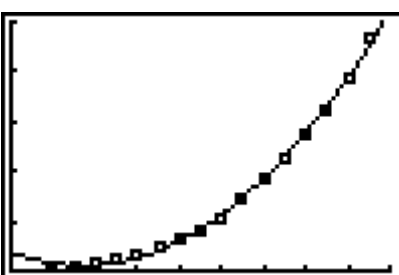
11. Make sure the type is highlighted as a scatter plot as shown to the right.

12. Under Xlist and Ylist, make sure that L_1 and L_2 appears. If not, move the cursor to Xlist and press 2nd|1 or move the cursor to Ylist and press 2nd|2 .

```

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

<p>13. Highlight one of the options for Mark and press ENTER. This is the mark that will be plotted in the scatter plot.</p>	
<p>14. Press GRAPH to see the scatter plot. If any other graphs appear on the scatter plot, you may have to clear the from the equation editor by pressing Y=. To clear an equation, move the cursor to the equation's line and press CLEAR.</p>	
<p>Find the quadratic model</p> <p>15. Press STAT to enter the statistics menu.</p> <p>16. Use ▸ to highlight CALC along the top of the screen.</p> <p>17. Press 5 or highlight 5: QuadReg and press ENTER. The QuadReg command will be pasted to the home screen.</p>	
<p>18. We need to supply the calculator with the lists we are finding a quadratic model for. Press 2nd 1, 2nd 2, to supply the names of the lists separated by commas.</p>	
<p>19. The final argument we want to enter is the location the model will be placed in the equation editor. Press VAR.</p>	

<p>20. Move the cursor to Y-VARS using the \square button.</p> <p>21. Press 1 or highlight 1: Function...</p>	 <p>A screenshot of the TI-84 Plus Y-VARS menu. The text reads: VARS Y-VARS, 1:Function..., 2:Parametric..., 3:Polar..., 4:On/Off...</p>
<p>22. Highlight the location in the equation editor you want to paste to and press \square.</p>	 <p>A screenshot of the TI-84 Plus Y-VARS menu. The text reads: Y-VARS, 1:Y1, 2:Y2, 3:Y3, 4:Y4, 5:Y5, 6:Y6, 7:Y7. The '1:Y1' option is highlighted with a cursor.</p>
<p>23. If you highlighted Y₁ above, it will be pasted to the homescreen at the end of the QuadReg command. This command calculates the quadratic model of the data in lists L₁ and L₂ and pastes the equation into Y₁.</p>	 <p>A screenshot of the TI-84 Plus QuadReg command screen. The text reads: QuadReg L1,L2,Y1.</p>
<p>24. Press \square to calculate the model. In this case the model is approximately</p> $y = 48.28x^2 - 334.70x + 785.96$	 <p>A screenshot of the TI-84 Plus QuadReg results screen. The text reads: QuadReg, y=ax^2+bx+c, a=48.27818627, b=-334.7017157, c=785.9610294, R^2=.9973030322.</p>
<p>25. Press \square to see the data and the corresponding quadratic model.</p>	 <p>A screenshot of the TI-84 Plus graph screen. It shows a scatter plot of data points and a smooth quadratic curve that fits the data points.</p>

