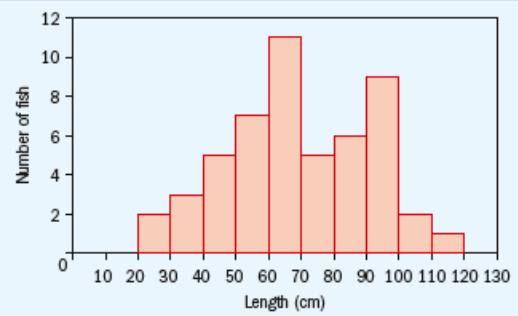
Chapter 5 / **Example 5**
Calculating measures of central tendency and dispersion

Later in this chapter, in 5.3, you are told to make sure you know how to use your GDC to find summary statistics and construct a box plot. In this example you will see how to do this.

Consider the following frequency histogram showing the length (x cm) of 51 fish caught in the River Avon.



1 State the median class.

2 State the range.

3 Comment on the distribution of the data.

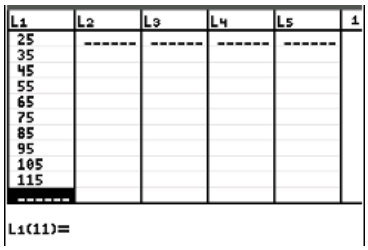
Press stat 1:Edit and press enter[format]

Type the numbers 25, 35, 45, 55, etc. in the first column.

These are the values of the midpoints of each bar in the frequency histogram.

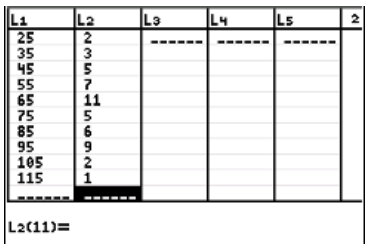
Press enter or ▼ after each number to move to the next cell.

Note: *If the list contains other numbers, you can clear it by pressing* stat 4:ClrList *and press* enter. *The home screen displays* ClrList. *Press* 2nd 1 [L1] *and press* enter. *Press* stat 1:Edit *and press* enter *to return to the table.*



Press ▶ to move to the next column.

Enter the frequencies of each of the lengths in the second column.

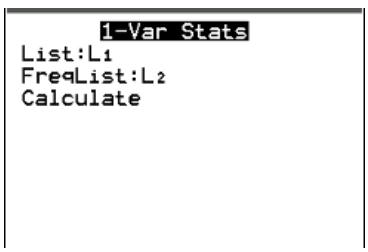


To find the summary statistics

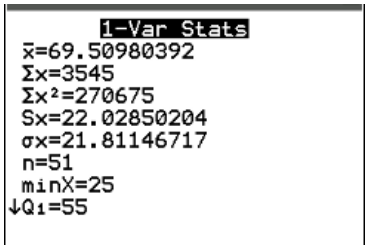
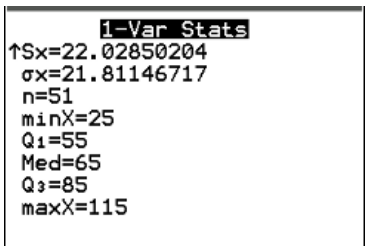
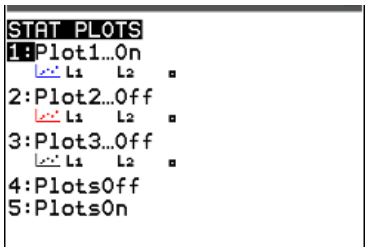
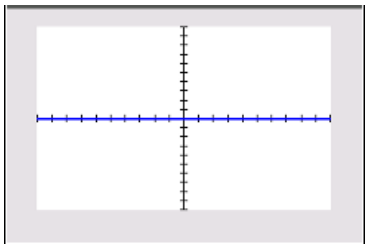
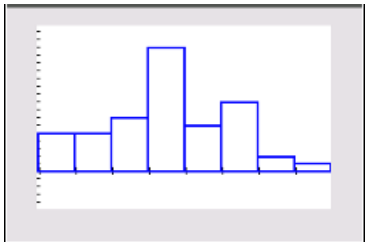
Press stat and ▶ to access the CALC menu.

Select 1:1-Var Stats and press enter.

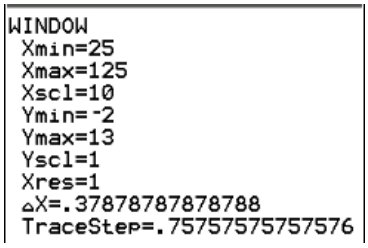
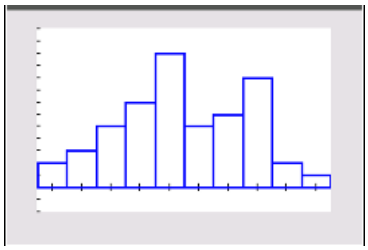
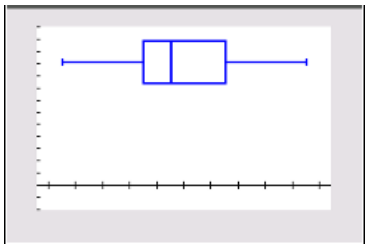
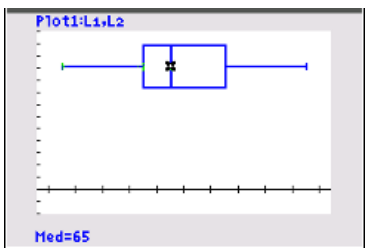
Enter L_2 as the FreqList by pressing 2nd 2 [L2].
Navigate to Calculate and press enter.



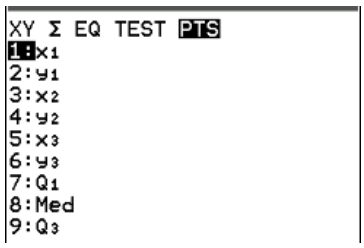
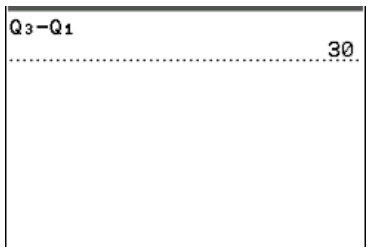
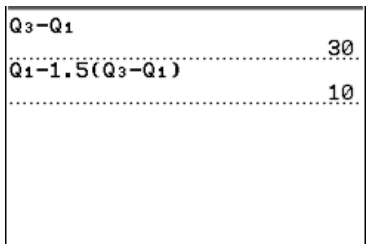
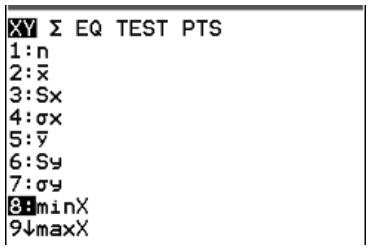
Chapter 5 / **Example 5**
Calculating measures of central tendency and dispersion

The GDC displays a list of statistics for the data.	
Scroll down to see the median, lower quartile, Q_1X and the upper quartile Q_3X using ▼. The median is 65 and the quartiles are 55 and 85. The range is MaxX – MinX. The interquartile range is $Q_3X - Q_1X$.	
Press [2nd] [f1] [stat plot]. Press [enter].	
Navigate through the list using [▶] [◀] [▲] [▼] keys. Select Type, Xlist L_1 and Freq L_2. Choose any color. Press [enter] after each choice. To enter L_2 press [2nd] [2] [L2][format]	
Press [f5] [graph]. The GDC displays a bar chart with the default axes. Since the values of *x* are all greater then 10, there is nothing to be seen.	
For a better view of the bar chart press [zoom] 9:ZoomStat. The bar chart now fits the window but the bars are the wrong widths to match the frequencies.	

Chapter 5 / **Example 5**
Calculating measures of central tendency and dispersion

Press [f2] [window]. Change Xmin to 25, Xmax to 125, Xscl to 10 and press [enter]. You can also change Ymin to -2 and Ymax to 13.	
Press [f5] [graph]. The GDC displays a histogram of the data.	
Press [2nd] [f1] [stat plot]. Press [enter].	
Navigate through the list using [▶] [◀] [▲] [▼] keys. Select Type: ⊡▪▪, Xlist: L_1 and Freq: L_2. Choose any color. Press [enter] after each choice. To enter L_1 press [2nd] [1] [L1] and to enter L_2 press [2nd] [2] [L2].	
Press [f3] [zoom] 9:ZoomStat. The GDC displays a box plot of the data. Since the plot type was with outliers shown, and there are none in the display, you can conclude that 37 is not an outlier. This is further demonstrated below.	
Press [f4] [trace] and use [▶] [◀] to move the cursor across the box plot with the touchpad. The display will change to show the maximum and minimum values, the quartiles and the median.	

Chapter 5 / **Example 5**
Calculating measures of central tendency and dispersion

Press [2nd] [quit] to enter the home screen. Press [vars] 5:Statistics… and use [▶] to navigate to PTS. The statistics that you calculated earlier are all stored as variables.	
To calculate the interquartile range Use IQR = $Q_3 - Q_1$. Select Q_3 and Q_1 from the list to enter the calculation. The inter quartile range is 30.	
To determine whether 37 is an outlier us $Q_1 - 1.5(IQR)$ Select Q_3 and Q_1 from the list to enter the calculation $Q_1 - 1.5 (Q_3 - Q_1)$. 10 < 25, so 25 is not an outlier.	
Press [vars] 5:Statistics… and use [▶] to navigate to XY. The statistics that you calculated earlier are all stored as variables.	
To calculate the range Use Range = maxX − minX. Select maxX and minx from to list to enter the calculation. The range is 90.