

Chapter 5 / **Example 8**

Using summary statistics

The number of text messages sent by a group of 15 students on a one-week residential trip were: 36, 40, 12, 0, 15, 25, 25, 78, 45, 28, 18, 3, 15, 19, 20,

- Find the mean and median number of text messages.
- Find the interquartile range.
- Determine if any of the data values can be considered as outliers.

For a short list of data, there is no need to use a frequency table.

Press **[stat]** 1:Edit and press **[enter]** **[format]**

Type 36, 40, 12, 0, etc. in the first column.

Press **[enter]** or **[↓]** after each number to move to the next cell.

L1	L2	L3	L4	L5	1
36					
40					
12					
0					
15					
25					
25					
78					
45					
28					
18					
L1(11)= 18					

To calculate summary statistics of the data.

Press **[stat]** and **[▶]** to access the CALC menu.

Select 1:1-Var Stats and press **[enter]**.

Leave FreqList empty.

Navigate to Calculate and press **[enter]**.

1-Var Stats					
List:	L1				
FreqList:					
Calculate					

The GDC displays a list of statistics for the data.

The results show that the mean (\bar{x}) number of messages is 25.3.

1-Var Stats					
\bar{x} =	25.26666667				
Σx =	379				
Σx^2 =	14727				
Sx=	19.18134014				
σx =	18.5309351				
n=	15				
minX=	0				
$\downarrow Q_1$ =	15				

Scroll down to see the median using **[↓]**.

The median number of messages is 20.

The quartiles are Q_1 and Q_3 .

1-Var Stats					
$\uparrow Sx$ =	19.18134014				
σx =	18.5309351				
n=	15				
minX=	0				
Q_1 =	15				
Med=	20				
Q_3 =	36				
maxX=	78				

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.

XY Σ EQ TEST PTS					
1:	x1				
2:	y1				
3:	x2				
4:	y2				
5:	x3				
6:	y3				
7:	Q1				
8:	Med				
9:	Q3				

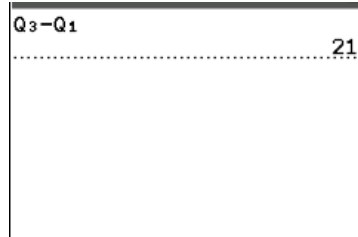
Chapter 5 / Example 8

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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 21.

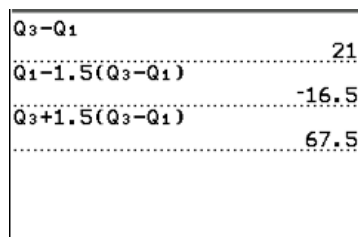


To determine whether there are any outliers use

$Q_1 - 1.5(Q_3 - Q_1)$ and $Q_3 + 1.5(Q_3 - Q_1)$.

Select Q_3 and Q_1 from the list obtained by pressing **[vars]** 5:Statistics... and using **[right arrow]** to navigate to PTS to enter these calculations.

$78 > 67.5$, so 78 can be considered to be an outlier.



Press **[2nd]** **[f1]** **[stat plot]**.

Press **[enter]**.



Navigate through the list using **[right arrow]** **[left arrow]** **[up arrow]** **[down arrow]** keys.

Select Type: **[box plot icon]**, Xlist: L_1 and leave Freq as 1. Choose any color.

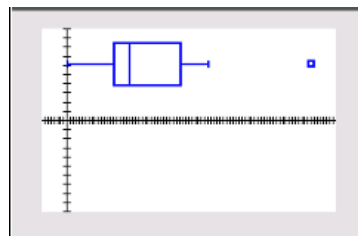
Press **[enter]** after each choice.

To enter L_1 press **[2nd]** **[1]** **[L1]**.



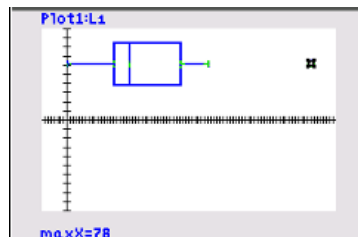
Press **[f3]** **[zoom]** 9:ZoomStat.

The GDC displays a box plot of the data.



Press **[f4]** **[trace]** and use **[right arrow]** **[left arrow]** to move the cursor across the box plot with the touchpad.

The boxplot displays the point 78 as an outlier.



Chapter 5 / **Example 8**

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