

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 **MENU** 2 **STAT** to display the List Editor screen.

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

Press **EXE** after each number to move to the next cell.

	List 1	List 2	List 3	List 4
SUB				
1	36			
2	40			
3	12			
4	0			
				0
GRAPH CALC TEST INTR DIST >				

Press **F2** CALC and **F6** SET.

Set 1Var XList to List1 and 1Var Freq to 1.

```
1Var XList :List1
1Var Freq  :1
2Var XList :List1
2Var YList :List2
2Var Freq  :1

LIST
```

Press **EXIT** and **F1** 1-VAR.

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-Variable
x̄ =25.2666666
Σx =379
Σx² =14727
σx =18.530935
sx =19.1813401
n =15
```

Scroll down to see the median using **▼**.

The median number of messages is 20.

The quartiles are Q_1 and Q_3 .

```
1-Variable
n =15
minX =0
Q1 =15
Med =20
Q3 =36
maxX =78
```

Press **MENU** 1 **RUN-MAT** to display the Run-Matrix screen for arithmetical calculations.

The statistics that you calculated earlier are all stored as variables.

To calculate the interquartile range Use $IQR = Q_3 - Q_1$.

Press **VAR** **F3** STAT **F3** GRAPH **F6** **▷** **F6** **▷** **F1** Q_3 .

Select Q_3 and Q_1 from the list to enter the calculation.

The inter quartile range is 21.

```
Q3-Q1
21
□
r r² MSe Q1 Med >
```

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To determine whether there are any outliers use
 $Q1 - 1.5(Q3 - Q1)$ and $Q3 + 1.5(Q3 - Q1)$.

Select Q3 and Q1 from the list to enter these calculations.

$78 > 67.55$, so 78 can be considered to be an outlier.

$Q3 - Q1$	21
$Q1 - 1.5(Q3 - Q1)$	-16.5
$Q3 + 1.5(Q3 - Q1)$	67.5
<input type="checkbox"/>	
r	r²
MSe	Q1
Med	▶

Press **MENU** 2  to display the List Editor screen.

Press **F1** GRAPH.

Press **F6** .SET

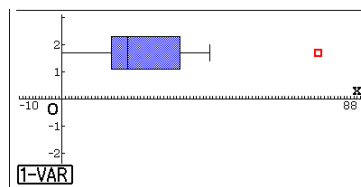
Choose Graph Type: **F6** ▶ **F2** MedBox, XList: List1 and
 Frequency: 1, Outliers **F1** On.

StatGraph1	
Graph Type	:MedBox
XList	:List1
Frequency	:1
Outliers	:On
Box	:Black
Whisker	:Black
<input type="checkbox"/> On	<input type="checkbox"/> Off

Press **EXIT**.

Press **F1** GRAPH1.

The GDC displays a box plot of the data.



Press **SHIFT** **F1** TRACE and use **▶** **◀** to move the cursor
 across the box plot with the touchpad.

The boxplot displays the point 78 as an outlier.

