

Example 10**Self Tutor**

A library surveys 20 borrowers each day from Monday to Friday, and records the number who are not satisfied with the range of reading material. The results are: 3 7 6 8 11.

The following year the library receives a grant that enables the purchase of a large number of books. The survey is then repeated and the results are: 2 3 5 4 6.

Find the range of data in each survey.

The range is the maximum minus the minimum data value.

For the first survey, the range is $11 - 3 = 8$.

For the second survey, the range is $6 - 2 = 4$.

Example 11**Self Tutor**

For the data set: 7, 3, 1, 7, 6, 9, 3, 8, 5, 8, 6, 3, 7, 1, 9 find the:

- a** median **b** lower quartile **c** upper quartile **d** interquartile range.

The ordered data set is: ~~1, 1, 3, 3, 3, 5, 6, 6, 7, 7, 7, 8, 8, 9, 9~~ (15 of them)

- a** As $n = 15$, $\frac{n+1}{2} = 8$ \therefore the median = 8th data value = 6

b/c As the median is a data value we now ignore it and split the remaining data into two:

lower	upper	$Q_1 =$ median of lower half = 3
$\overbrace{1\ 1\ 3\ 3\ 3\ 5\ 6}$	$\overbrace{7\ 7\ 7\ 8\ 8\ 9\ 9}$	$Q_3 =$ median of upper half = 8

- d** $IQR = Q_3 - Q_1 = 8 - 3 = 5$

Example 12**Self Tutor**

For the data set: 6, 4, 9, 15, 5, 13, 7, 12, 8, 10, 4, 1, 13, 1, 6, 4, 5, 2, 8, 2 find:

- a** the median **b** Q_1 **c** Q_3 **d** the IQR.

The ordered data set is:

~~1 1 2 2 4 4 4 5 5~~ 6 6 ~~7 8 8 9 10 12 13 13 15~~ (20 of them)

a As $n = 20$, $\frac{n+1}{2} = 10.5$

\therefore the median = $\frac{10\text{th value} + 11\text{th value}}{2} = \frac{6+6}{2} = 6$

b/c As we have an even number of data values, we split the data into two:

lower
upper

1 1 2 2 4 4 4 5 5 6
6 7 8 8 9 10 12 13 13 15

$\therefore Q_1 = \frac{4+4}{2} = 4$, $Q_3 = \frac{9+10}{2} = 9.5$

d $IQR = Q_3 - Q_1$
 $= 9.5 - 4$
 $= 5.5$

Example 13**Self Tutor**

Consider the data set:

20, 31, 4, 17, 26, 9, 29, 37, 13, 42, 20, 18, 25, 7, 14, 3, 23, 16, 29, 38, 10, 33, 29

Use technology to find the:

- a** range **b** interquartile range.



**GRAPHICS
CALCULATOR
INSTRUCTIONS**

Casio fx-CG20

1-Variable	
n	=23
minX	=3
Q1	=13
Med	=20
Q3	=29
maxX	=42

TI-84 Plus

1-Var Stats	
n	=23
minX	=3
Q1	=13
Med	=20
Q3	=29
maxX	=42

TI-nspire

*Unsaved	
"ox := oax"	10.838
"n"	23.
"MinX"	3.
"Q1X"	13.
"MedianX"	20.
"Q3X"	29.
"MaxX"	42.
"SSX := Σ(x- \bar{x}) ² "	2701.65

a range = maximum – minimum
 $= 42 - 3$
 $= 39$

b $IQR = Q_3 - Q_1$
 $= 29 - 13$
 $= 16$