Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Box Plots

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

- Write your name in the space provided.

- Write your answers in the spaces provided in this question paper.

- Answer ALL questions.

- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

- You should have a ruler, compass and protractor where required.

Total Marks :

1) The number of miles that a sample of 13 new cars can travel on one gallon of petrol is listed below.

44   41   44   55   47   77   48   53   50   32   70   62   56

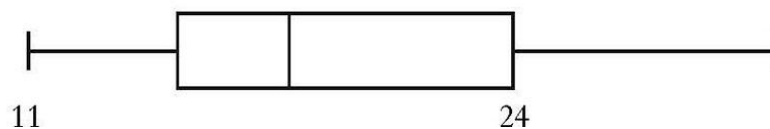Complete the boxplot, drawn below, to show this information.

| ☐ | | 44 | ☐ | | ☐ | | 77 |
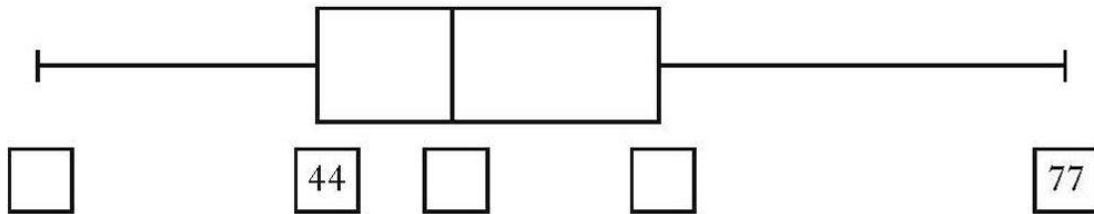
[3]

2) The number of hours of sunshine in Lerwick each December during a 10 year period is listed below.
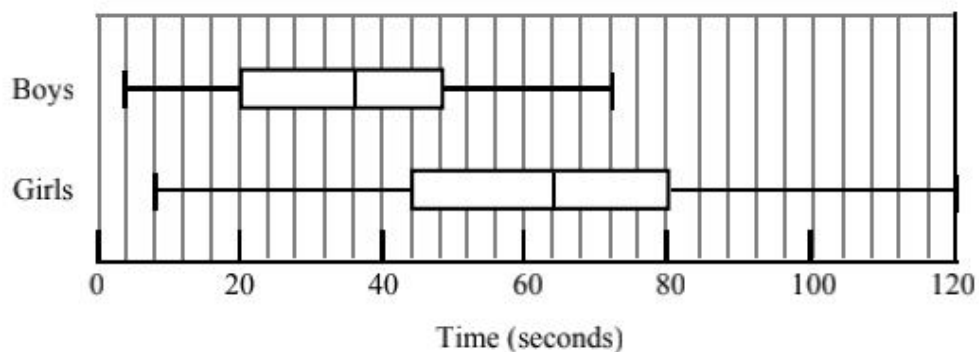
16   20   13   11   28   16   31   24   15   23

Complete the boxplot, drawn below, to show the number of hours of sunshine.

11   24   **4**

3) The **box plots** below represent the time, in seconds, which a sample of children spent using their mobile phones during one day.

Time (seconds)

(a) Use the box plots to complete the table below.

	Boys	**Girls**
Lower Quartile	20	
Median		
Upper Quartile		80
Interquartile Range		

(b) Use this information to compare the times spent by the boys and the girls using their mobile phones.

_____

_____

_____

7 marks

4) An airline records the number of passengers who fail to turn up for their flights each month.

The numbers for 2017 are

$$25, \ 14, \ 32, \ 29, \ 20, \ 43, \ 17, \ 20, \ 38, \ 27, \ 49, \ 23.$$
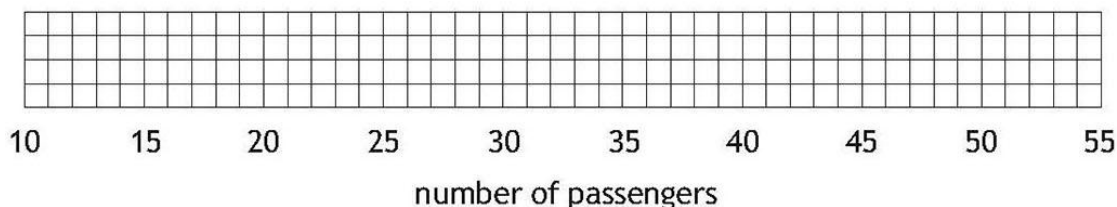
(a) For this data, calculate

- the median
- the lower quartile
- the upper quartile. **2**

(b) Construct a boxplot for this set of data.

2

number of passengers

(c) Calculate the interquartile range for this set of data. **1**

In 2016, the interquartile range for the number of passengers who failed to turn up for their flights was 17.

(d) Make one valid comment comparing the number of passengers who failed to turn up for their flights in these two years. **1**

5) The box plot for the times taken by a group of boys to run 100 metres is shown below.
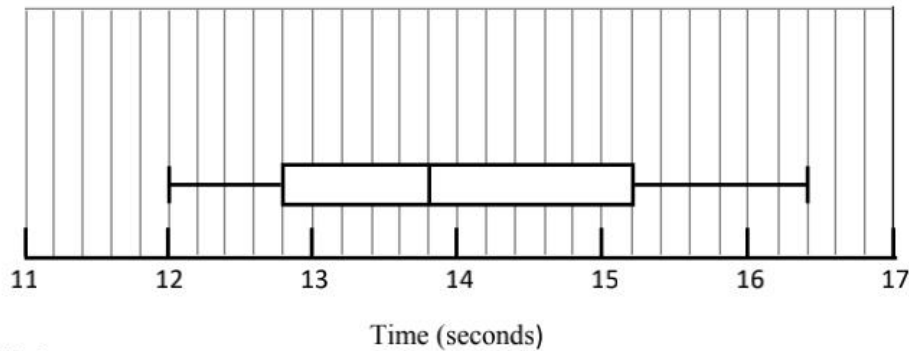
Time (seconds)

(a) Fill in.

fastest time = _____ seconds

median time = _____ seconds

(b) What percentage of the boys ran the 100 metres in less than 12.8 seconds?

Ans: _____

(c) Work out the interquartile range.

Ans: interquartile range = _____ seconds

After a month of training, the boys obtained the following times (in seconds).

Fastest time	Lower quartile	Median	Upper Quartile	Slowest time
11.4	12.2	13.0	14.8	16.8

(d) Using the same scale and axes, draw another box plot to show this data.

(e) Do you think that the training was effective in improving the boys' time? Give a reason for your answer.

_____

_____

(9 marks)

6) For a group of freezers in a shop, the volume, in litres, of each one is listed below.

$$78 \quad 81 \quad 91 \quad 75 \quad 85 \quad 83 \quad 84 \quad 78$$

(a) For the given data, calculate:

    (i) the median;   **1**

    (ii) the lower quartile;   **1**

    (iii) the upper quartile.   **1**

One of the numbers from the above list was accidentally missed out. A boxplot was then drawn and is shown below.
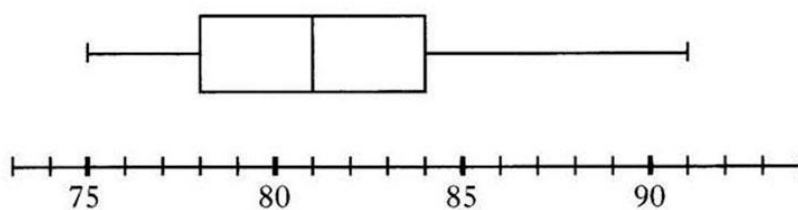
(b) Which number was missed out?

Give a reason for your answer.   **2**

7) At a ski resort the temperature, in degrees Celsius, was recorded each day at noon for the first fortnight in February 2013.

$$0 \quad -1 \quad 2 \quad -5 \quad 4 \quad 2 \quad -3 \quad 1 \quad -4 \quad 8 \quad -6 \quad 4 \quad -2 \quad 1$$

(a) Calculate:

    (i) the median temperature; **1**

Answer..

    (ii) the lower quartile; **1**

Answer..

    (iii) the upper quartile. **1**

Answer..

(b) Use the above data to construct a boxplot. **2**

```
 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
-6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6   7   8
```
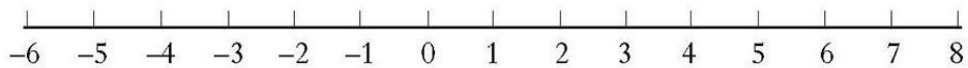
(c) The temperature, in degrees Celsius, was recorded at the same ski resort each day at noon for the first fortnight in February 2014.

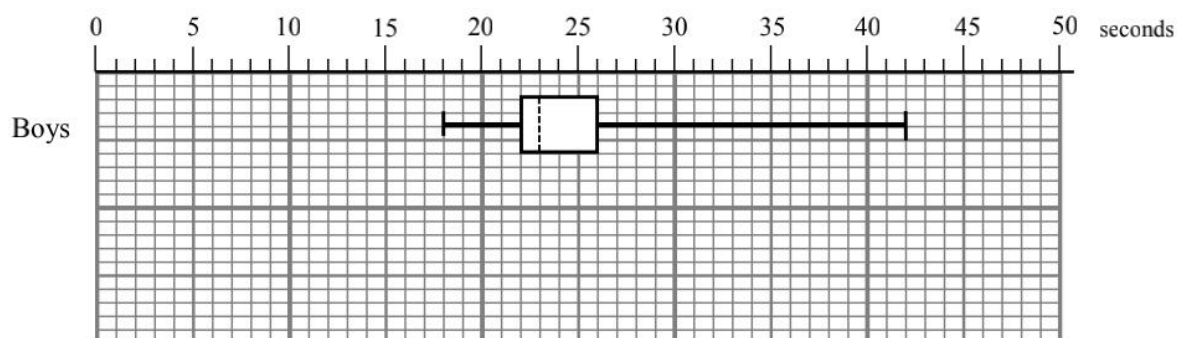The following boxplot was constructed.

```
     ├───────────┤  ┌──────┬──────┐  ├───────────────┤
                    └──────┴──────┘
 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
-6  -5  -4  -3  -2  -1   0   1   2   3   4   5   6   7   8
```
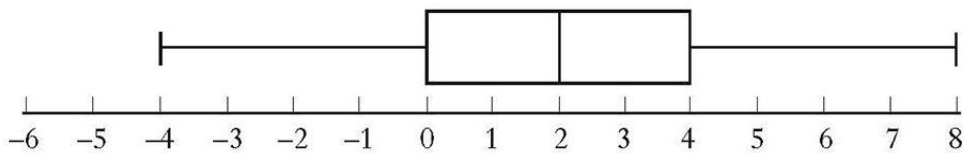
Compare the two boxplots and comment. **2**

8)   The time taken for a group of boys and a group of girls to run 100 m is recorded.
The box plot below shows the distribution of the boys' times.

```
        0     5    10    15    20    25    30    35    40    45    50   seconds

Boys
```

a)   Write down the **median** time.

Ans: _____ seconds

b)   Calculate the **range**.

Ans: _____ seconds

For the girls' group, the information below is available.

lowest time: 16 seconds	**median**: 28 seconds	**lower quartile**: 23 seconds
	interquartile range: 8	**range**: 24

c)   On the diagram above, draw the box plot for the distribution of the **girls'** time.

d)   Underline the correct answer.

i)   The fastest runner is a (boy, girl).

ii)   The slowest girl is (slower, faster) than the slowest boy.

(7 marks)

9) Before training, athletes were tested on how many sit-ups they could do in one minute.
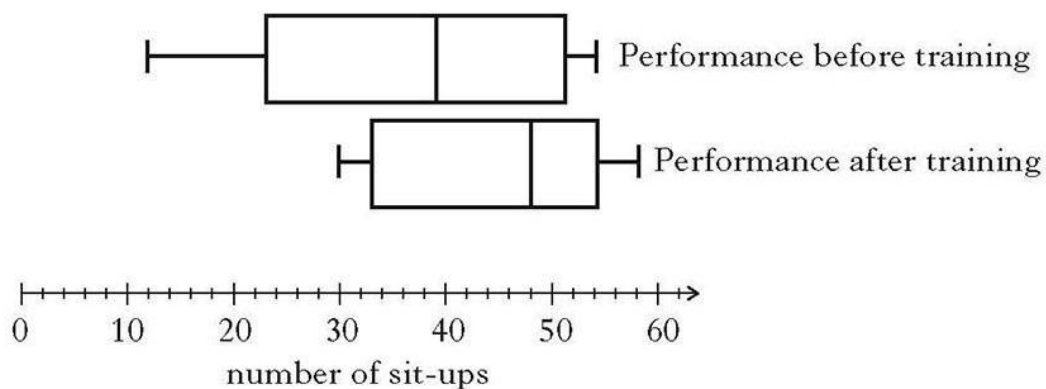
The following information was obtained:

lower quartile (Q_1) 23

median (Q_2) 39

upper quartile (Q_3) 51

a) Calculate the interquartile range.

[2]

After training, the athletes were tested again.

Both sets of data are displayed as boxplots.

(b) Make **two** valid statements to compare the performances before and after training.

[2]

10) A manufacturer of matches claims that there are "on average 60 matches per box".

A sample of eleven boxes contains the following numbers of matches per box.

58, 62, 60, 65, 59, 60, 59, 62, 61, 61, 64

(a) For this sample find:

(i) the median; **1**

Answer...
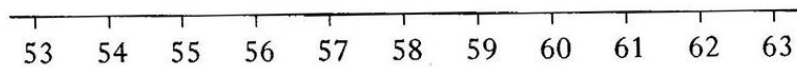
(ii) the lower quartile; **1**

Answer...

(iii) the upper quartile. **1**

Answer...

(b) Comment on the claim made above. **1**

(c) Construct a boxplot for the data. **2**

```
   ┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬
   53   54   55   56   57   58   59   60   61   62   63
```

(d) A different sample of matchboxes was taken.
The boxplot, shown below, was drawn for the new data.

```
        ├───────┌──────┬────────┐──┤
   ┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬
   53   54   55   56   57   58   59   60   61   62   63
```
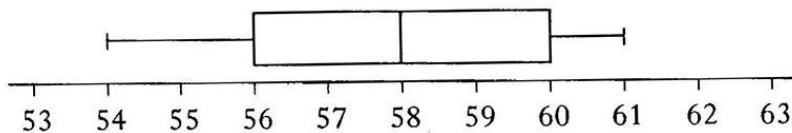
Does this new data support the manufacturer's claim?
Give a reason for your answer. **1**

11) The local youth club runs a weekly tuck shop. Any profit that is made is donated to a local charity.

The stem and leaf diagram shows their weekly takings for the first 6 months of this year.

```
0 | 5  7  7  8  9  9
1 | 0  2  5  6  6  7  8  8  8  9
2 | 0  1  1  2  3  5
3 | 0  4
```

n = 24   3 | 4 represents £34
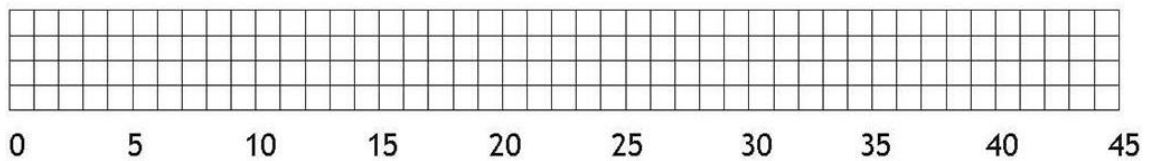
(a)   (i)   State:

the median

the lower quartile

the upper quartile.   **2**

(ii) Using the above data construct a boxplot in the space provided.

2

```
0      5      10     15     20     25     30     35     40     45
```

12) Fifteen medical centres each **handed out** a questionnaire to fifty patients.

The numbers who replied to each centre are shown below.

$$11 \quad 19 \quad 22 \quad 25 \quad 25$$

$$29 \quad 31 \quad 34 \quad 36 \quad 38$$

$$40 \quad 46 \quad 49 \quad 50 \quad 50$$

Also, they each **posted** the questionnaire to another fifty patients.

The numbers who replied to each centre are shown below.

$$15 \quad 15 \quad 21 \quad 22 \quad 23$$

$$25 \quad 26 \quad 31 \quad 33 \quad 34$$

$$37 \quad 39 \quad 41 \quad 46 \quad 46$$

Use the data above to create box plots. Explain which method would be better to use in future. Give evidence from your box plots. Show your working.

[8]