

Name: _____

GCSE Statistics

Measures of Dispersion

Total marks available: 33

Total marks achieved: _____

Instructions

- Use black ink or ball-point pen.
- Fill in the boxes at the top of this page with your name, Centre number and candidate number.
- Answer all questions.
- Answer the questions in the spaces provided
 - There may be more space than you need.
- Scientific calculators may be used.
- You must show all your working out with your answer clearly identified At the end of your solution.

Information

- The marks for each question are shown in brackets
 - use this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Q1.

Diana is a journalist working for a local newspaper.

She is writing a newspaper article about how house prices in the local area have changed.

Diana has house price data for 1996 and for 2016

She plans to include in her article the median house price for 1996 and the median house price for 2016

Mika thinks that Diana should also include in her article the interquartile range of house prices for 1996 and the interquartile range of house prices for 2016

(a) Give one reason why including the interquartile ranges in the article would be appropriate.

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(1)

(b) Give one reason why including the interquartile ranges in the article would **not** be appropriate.

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(1)

(Total for question = 2 marks)

Q2.

Alex is investigating the monthly charges of 7 different companies for each of two types of phones, phone A and phone B.

Here are the monthly charges, in pounds, for phone A.

23 23 26 31 32 36 40

(Source: *moneysupermarket.com*)

(a) Find the interquartile range of these charges.

£
(2)

The interquartile range of the monthly charges for phone B is £8

(b) (i) compare the spread of the charges for phone A and for phone B.

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.....
(1)

The 25th percentile of the monthly charges for phone B is £36

(ii) Work out the 75th percentile for phone B.

£
(2)

(Total for question = 5 marks)

Q3.

The table shows information about the ages, when elected, of French presidents and UK prime ministers for the years 1850 to 2015

	Lowest value	Lower quartile	Median	Upper quartile	Highest value
French presidents	40	53	60.5	65	74
UK prime ministers	43	53	56.5	63	70

(Source: *Wikipedia*)

Compare and interpret the spread of ages of French presidents with UK prime ministers for the years 1850 to 2015

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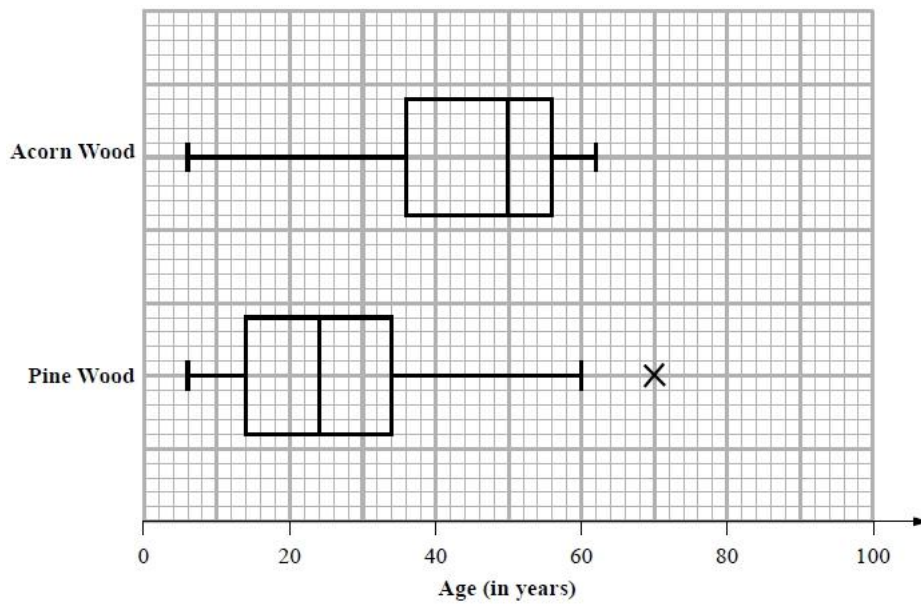
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(Total for question = 5 marks)

Q4.

The box plots give information about the distributions of the ages of the trees in Acorn Wood and in Pine Wood.



Simon uses the information in the box plots to conclude that

"The average age of the trees in Acorn Wood is greater than the average age of the trees in Pine Wood. Both distributions have the same spread. Both distributions have a positive skew."

Comment on Simon's conclusions with reference to his use of statistical words and the accuracy of his statements.

Give reasons for your answer.

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(5)

(Total for question = 5 marks)

Q5.

Salyza works for an IT company.
She wants to collect information about the earnings of workers at the company.

Here are the annual earnings of the 10 employees at another company.

£21 000	£21 200	£22 250	£23 000	£23 750
£24 000	£25 700	£25 800	£29 000	£51 500

Salyza wants to find a measure of spread for these earnings of these employees.

Explain the advantage of using the interquartile range rather than the range for this information.

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(1)

(Total for question = 1 mark)

Q6.

The back-to-back stem and leaf diagram gives information about the ages of a random sample of members of parliament in Canada and in the UK.

Canada		UK
7 3 2 2	3	5 7
8 6 4 4 4 3	4	0 0 1 3 3 6 8 8
7 5 4 4 3 1 0	5	2 3 4 5 6 7
9 5 1 1 1	6	0 2 2 2 3 8 9
4 3 1	7	7 9

Key:
 2|3|5 represents an age of 32 for a member of parliament in Canada and an age of 35 for a member of parliament in the UK

(Source: en.wikipedia.org)

(a) Give a reason to support the use of a back-to-back stem and leaf diagram to represent this information.

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(1)

Some information about the quartiles of these two distributions is given in the table below.

	Canada	UK
lower quartile	44	<i>b</i>
median	<i>a</i>	54
upper quartile	61	<i>c</i>

(b) Find the value of *a*, the value of *b* and the value of *c*

a =

b =

c =

(3)

(c) Write down the proportion of members of parliament in the UK that are likely to be older than 54 years old.

Give a reason for your answer.

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(1)

(d) Compare the spread of ages for members of parliament in Canada with the spread of ages for members of parliament in the UK.

State clearly the values of the statistic you use to make your comparison.
Interpret your comparison.

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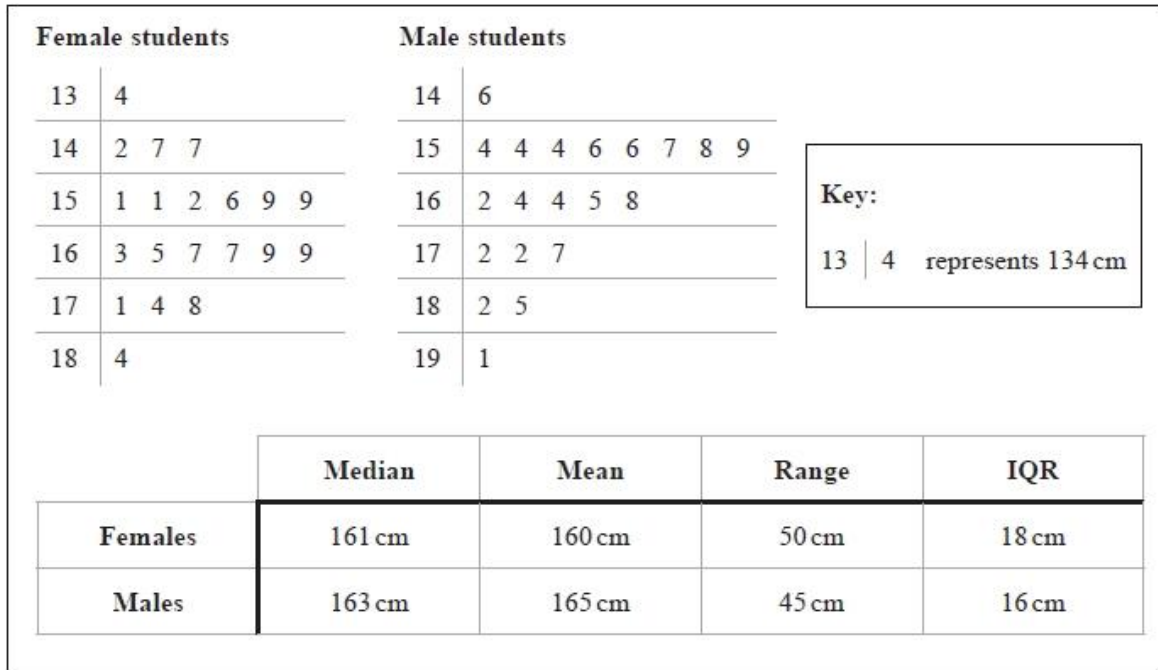
(3)

(Total for question = 8 marks)

Q7.

Mayokun measured and recorded the height, to the nearest cm, of each of the first 20 female students and of each of the first 20 male students to arrive at his college one morning.

He used statistical software to produce these diagrams and these summary statistics to help him compare the distributions.



Mayokun chose to use stem and leaf diagrams rather than histograms.

(a) Give one advantage of using stem and leaf diagrams rather than histograms for Mayokun's data.

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(1)

Before collecting his data, Mayokun wrote down two hypotheses.

1. Males are taller than females.
2. The heights of males vary more than the heights of females.

(b) Using appropriate results from Mayokun's survey, discuss any conclusions that he might have made about his hypotheses.

You should comment on the reliability of the conclusions.

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(6)

(Total for question = 7 marks)