

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE STATISTICS

F

Foundation tier Paper 2

Date of Exam

Afternoon

Time allowed: 1 hour 45 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of the page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross out any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
 - The maximum mark for this paper is 80.
 - You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.
-

Answer **all** questions in the spaces provided.

1 What is the probability of getting a 'Head' when a fair 2 pence coin is thrown?

Circle your answer.

[1 mark]

0

0.2

0.5

1

2 What is the median of these 4 numbers?

2 10 6 2

Circle your answer.

[1 mark]

2

4

5

8

10

3 In 2014 the price of a tablet PC was lower than in 2013

Taking 2013 as the base year, which of these statements is true about the index number for the price of a tablet in 2014?

Circle your answer.

[1 mark]

It is less than 100

It is exactly 100

It is more than 100

4 Which of the following values of Spearman's rank correlation coefficient shows the strongest correlation?

Circle your answer.

[1 mark]

-1

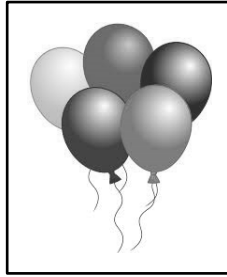
-0.6

0

0.2

0.89

- 5 A company makes packs of balloons.



Jo opens eight packs and counts the number of balloons in each pack.

Her results are

10 11 10 11 9 10 11 9

- 5 (a) Use this information to find the probability that a pack contains **at least** 10 balloons.

[2 marks]

Answer _____

- 5 (b) Jo also has a box that contains 100 packs of balloons.

Use your answer to part (a) to show that an estimate for the number of packs containing at least 10 balloons in the new box is 75.

[1 mark]

- 5 (c) Jo says,

“75% of the company's pack of balloons contain at least 10 balloons.”

- 5 (c) (i) Comment on the validity of her statement.

[1 mark]

- 5 (c) (ii) How could the estimate of 75% be improved?

[1 mark]

- 6** Steve is planning a camping holiday.
He wants to go to either France or Belgium.
The stem-and-leaf diagram shows the price per night, in euros, at the 15 campsites he finds in **France**.



Key : 2 | 0 represents 20 euros

- 6 (a)** Give **one** reason why the mean is not the best average to find for these data. **[1 mark]**

- 6 (b)** Find the median price in France. **[2 marks]**

Answer _____

- 6 (c)** Work out the interquartile range of the prices in France. **[3 marks]**

Answer _____

- 6 (d)** The table shows summary values for the price per night in euros at some campsites in **Belgium**.

Belgium	Median	Interquartile range	Range
Price per night	24 euros	15 euros	38 Euros

Compare the average and spread of cost per night at campsites in Belgium and France.

You may need to use some or all of the values in the table.

[4 marks]

Turn over for the next question

7 Jon has a box of video games which contains 6 sports games, 7 action games and 2 role-play games.

7 (a) Jon takes a game at random from his box.

What is the probability that the video game is a sports game?

Circle your answer.

[1 mark]

$$\frac{2}{15}$$

$$\frac{6}{15}$$

$$\frac{7}{15}$$

$$\frac{9}{15}$$

$$\frac{6}{9}$$

7 (b) Sandra has a box of video games which contains 11 sports games, 6 action games and 3 role-play games.

She takes a game at random from her box.

Show that the game Sandra takes from her box is more likely to be a sports game than the game Jon takes from his box.

[2 marks]

7 (c) Work out the probability that Jon and Sandra both take sports games.

[2 marks]

Answer _____

- 8** The table shows the marital status, in thousands, for the population of England and Wales from 2004 to 2009 inclusive.

One piece of data is missing.

All ages	2004	2005	2006	2007	2008	2009
Single	24 024	24 385	24 751	25 137	25 523	25 878
Married	21 920	21 866	21 773	21 709	21 672	21 656
Widowed	3350	3307	3264	3227	3191	3156
Divorced	3761	3858	3937	4010		4120
Totals	53 055	53 416	53 725	54 083	54 455	54 810

Source: Adapted from Annual Abstract of Statistics 2010

- 8 (a)** How many of the population were classed as 'Widowed' in 2006?

[1 mark]

Answer _____ thousand

- 8 (b)** Work out the number missing for 'Divorced' in 2008

[1 mark]

Answer _____ thousand

- 8 (c)** Describe the trend in the number of 'Married' persons between 2004 and 2009

[1 mark]

- 9** Jason records the distance travelled in miles and the amount of fuel used in gallons for 10 journeys in his car.

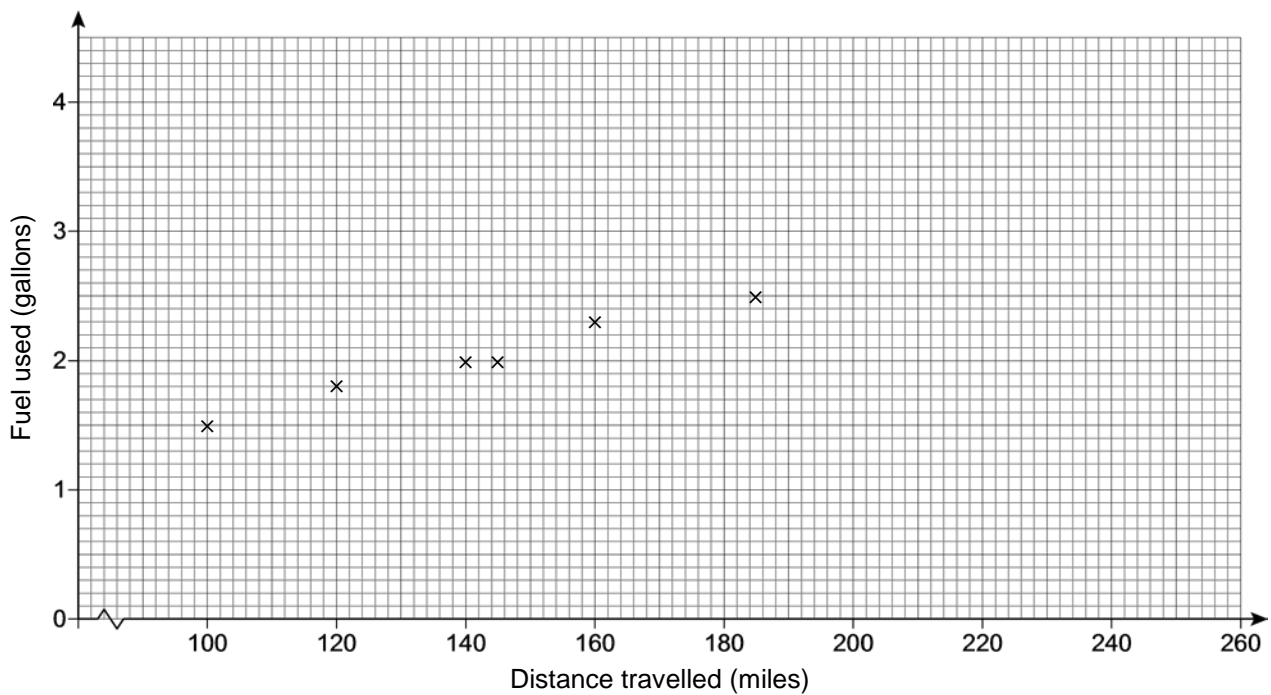
The table shows his records.

Distance (miles)	100	120	140	145	160	185	200	230	240	250
Fuel used (gallons)	1.5	1.8	2	2	2.3	2.5	2.8	3.2	3.3	3.6

- 9 (a)** The first six points have been plotted for you.

Complete the scatter chart for the data.

[2 marks]



- 9 (b)** What type of correlation is shown in the scatter chart.

[1 mark]

Answer _____

9 (c) Circle the word that best describes the variable 'distance travelled'.

[1 mark]

Dependent

Explanatory

Horizontal

Response

9 (d) Work out the mean amount of fuel used in these 10 journeys.

[3 marks]

Answer _____ gallons

9 (e) The mean distance travelled is 177 miles.

Use this and your answer to part **(d)** to draw a line of best fit on the scatter chart.

[2 marks]

9 (f) Use your line of best fit to estimate the amount of fuel Jason uses on a journey of 210 miles.

[1 mark]

Answer _____

Turn over for the next question

Turn over ►

9 (g) After a different journey Jason has used 3.7 gallons of fuel.

Use your line of best fit to estimate the distance he travelled.

[1 mark]

Answer _____

9 (h) Which of the answers, part **(f)** or part **(g)** do you think is more reliable?

Tick a box.

[1 mark]

Part **(f)**

Part **(g)**

Give a reason for your answer.

Reason _____

10 Sian is doing a statistical study into the amount of pocket money received by the boys and the girls in her year group at her school.

10 (a) Write down a hypothesis Sian could use.

[1 mark]

10 (b) State the population of her study.

[1 mark]

10 (c) (i) Sian considers asking the first 10 boys and 10 girls she meets one morning.

State the name of this sampling method.

[1 mark]

10 (c) (ii) Is this sampling method likely to give a representative sample?

Tick a box.

[1 mark]

Yes No

Give a reason for your answer.

Reason _____

10 (d) Sian decides to use a simple random sample.

Briefly describe how she could do this.

[2 marks]

10 (e) She decides to use a questionnaire to collect her data.

One of her questions is,

'How much pocket money do you receive?'

State **two** problems with this question.

[2 marks]

Problem 1 _____

Problem 2 _____

10 (f) Sian says she will now have all the data she needs to test her hypothesis.

Is Sian correct?

Give a reason for your answer.

[1 mark]

10 (g) Sian is worried that she may have a low response rate.

Describe **one** thing that she could do to help avoid this.

[1 mark]

10 (h) She decides to do a pilot study before handing her questionnaire out.

What is a pilot study?

[1 mark]

Turn over for the next question

11 Sarah is carrying out a statistical study into how people travel.

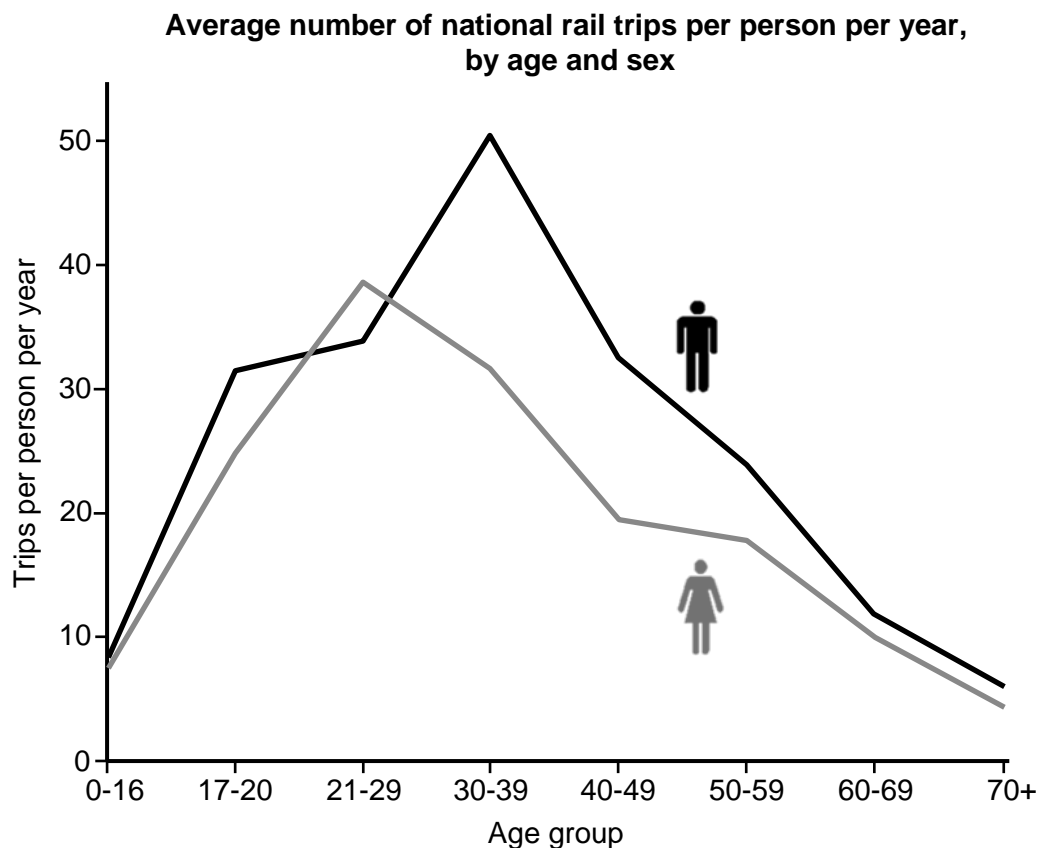
11 (a) Sarah downloads data from the internet.
Circle the word that best describes this type of data.

[1 mark]

Primary Secondary Raw Experimental

She downloads some graphs from the internet.

The first graph is shown below.



11 (b) Sarah says,
‘Generally men make more trips per year than women.’

Is Sarah correct?

Tick a box.

[1 mark]

Yes No

Give a reason for your answer.

Reason _____

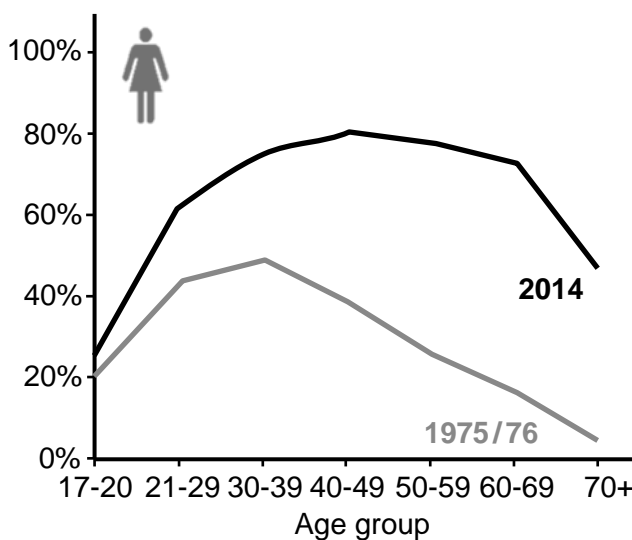
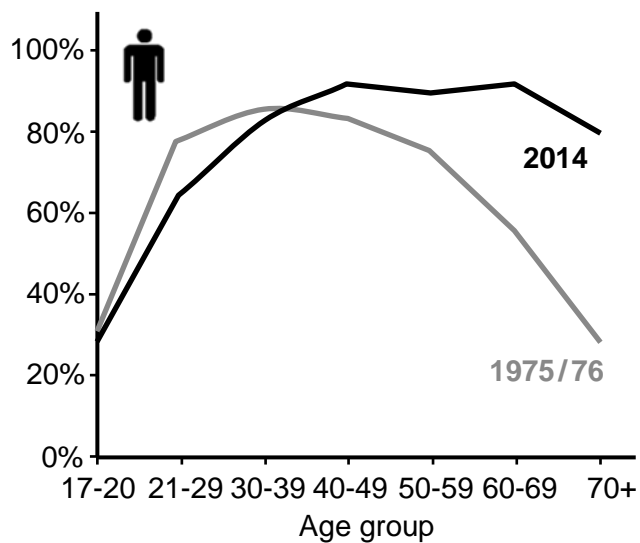
11 (c) Make one other interpretation of the frequency diagram.

You should refer to the diagram in your answer.

[2 marks]

The second diagram Sarah downloads is shown below.

Full car driving licence holders by age and gender: England 1975/76 and 2014



11 (d) Sarah says,

‘More men than women have driving licences in 2014.’

State one reason why Sarah may not be correct.

[1 mark]

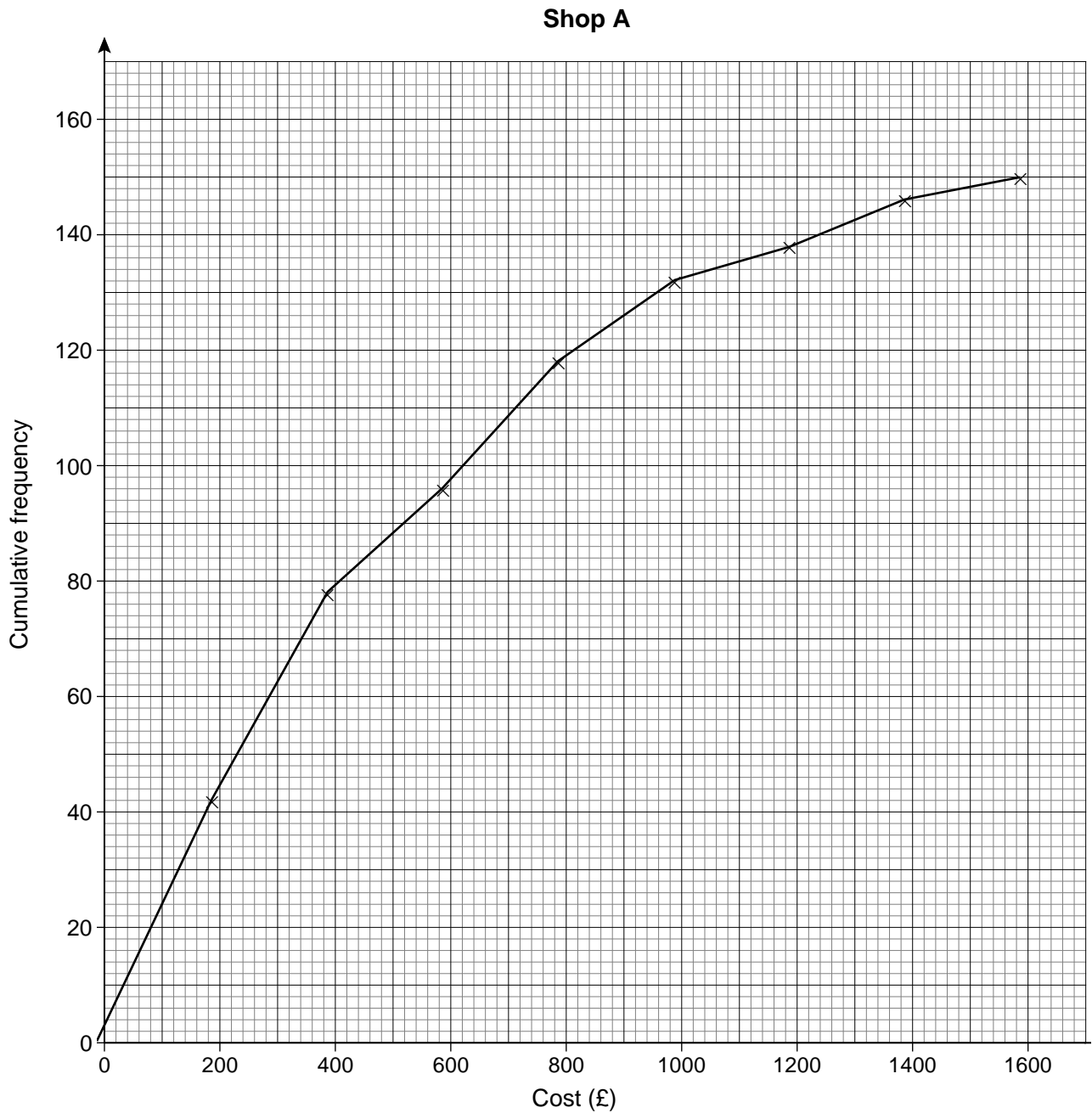
11 (e) Make **two** further comparisons using the graphs.

[2 marks]

Comparison 1 _____

Comparison 2 _____

- 12** The cumulative frequency graph represents the prices of the 150 different TVs sold by shop A.



- 12 (a)** Which class contains the largest number of TVs for shop A?
Circle your answer.

[1 mark]

£0 up to £199.99

£200 up to £399.99

£400 up to £599.99

£600 up to £799.99

£800 up to £999.99

12 (b) Shop B also sells TVs.

Here is some information about Shop B prices.

- median = £450
- interquartile range = £300

Mary is writing a post on social media comparing prices of TVs in the two shops.

Compare these prices statistically.

[6 marks]

12 (c) Mary writes in her post,

“The shop with the lower median will always sell a particular TV cheaper than the other shop.”

Is Mary right?

Tick a box.

[1 mark]

Yes No

Give a reason for your answer.

- 13** Jane and Phil are studying house prices to compare Cumbria and Cornwall.
- They are going to send their findings to a local newspaper in Cumbria.
- Their hypothesis is 'house prices in Cornwall are more expensive than house prices in Cumbria.'
- They collect their data from a website which gives the house prices for all houses for sale in each area.
- They sort each list into price order and then collect their samples.

- 13 (a)** Jane uses the first 30 house prices from each area.

What is the name of this sampling method?

[1 mark]

- 13 (b)** State **one** reason why this method will **not** produce a sample which is representative of the house prices in each area.

[1 mark]

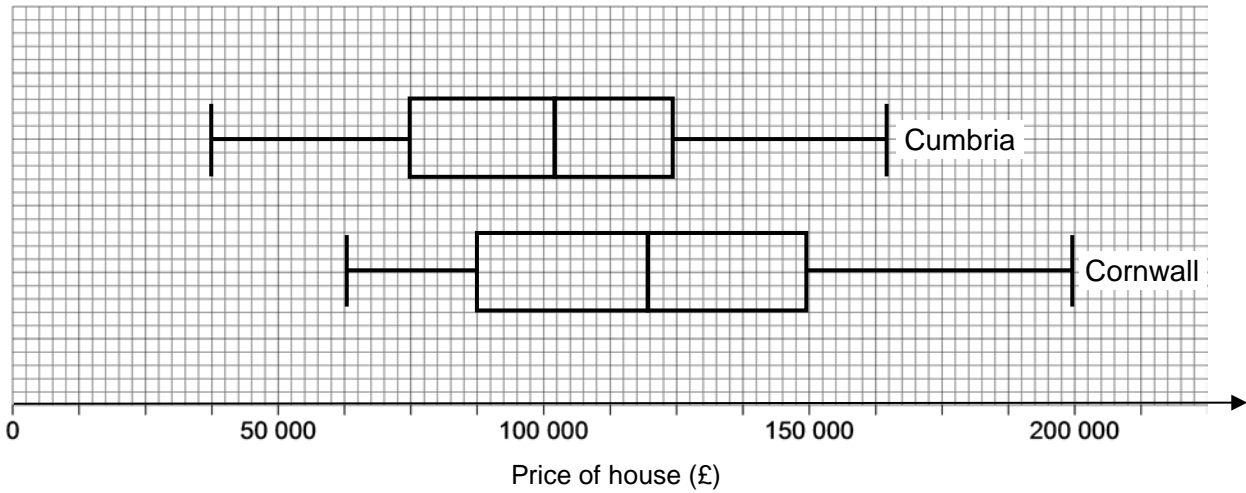
- 13 (c)** Phil decides to use a different method to collect his sample.

Describe **one** method that Phil could use to collect a sample of 30 which is likely to be more representative of the house prices in each area.

You should include the name of your sampling method, and a reason why a sample using this method is likely to be more representative.

[4 marks]

Phil draws these boxplots.



13 (d) Give reasons why these diagrams.

- are appropriate to comment on their hypothesis
- support their hypothesis.

[3 marks]

13 (e) Phil says,
"House prices are more varied in Cornwall."

Is Phil correct?

Give a reason for your answer.

[1 mark]

Jane calculates the mean and range for each of her two sets of data.

	Mean	Range
Cumbria	£74 300	£48 500
Cornwall	£64 800	£50 000

13 (f) Write down **two** different interpretations that Jane could make using these values.

Give **one** reason for **each** interpretation, write your answers so they can be understood by the readers of the local newspaper.

[4 marks]

13 (g) Jane decides to develop her study to include the number of bedrooms each house has.

State **one** other variable that she could include to develop her study.

[1 mark]

END OF QUESTIONS

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