

**Statistics GCSE****Paper 2**

2025

Edexcel Higher

Variant 1 (same as video)

1ST0/1H

**Instructions**

- Write all answers in the spaces provided.
- Answer all questions.
- You must show all your working.
- There may not be enough space to show all your working out.

**Information**

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**Advice**

- You can get support for all these questions at our website: [www.statsgcse.com](http://www.statsgcse.com)
- This paper and more are available on our site with questions that change subtly after each attempt.
- Good luck!

1 At a business conference, 60% of attendees are industry professionals and 40% are students.

Jasmine and Leo plan to conduct a feedback survey.

Jasmine decides to use simple random sampling to select 50 participants.

She uses the official attendee list as a sampling frame, assigning a number to each participant.

She then generates 50 random numbers and selects her sample accordingly.

Leo decides to use quota sampling to collect a sample of 50 participants.

He plans to stand at the registration desk until 30 industry professionals and 20 students have been interviewed.

(a) Give two reasons why Jasmine's method may **not** produce a sample of 50 participants.

(2 marks)

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(b) Give **two** advantages of quota sampling.

(2 marks)

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(c) Explain why the quota sample used by Leo is not a random sample.

(1 mark)

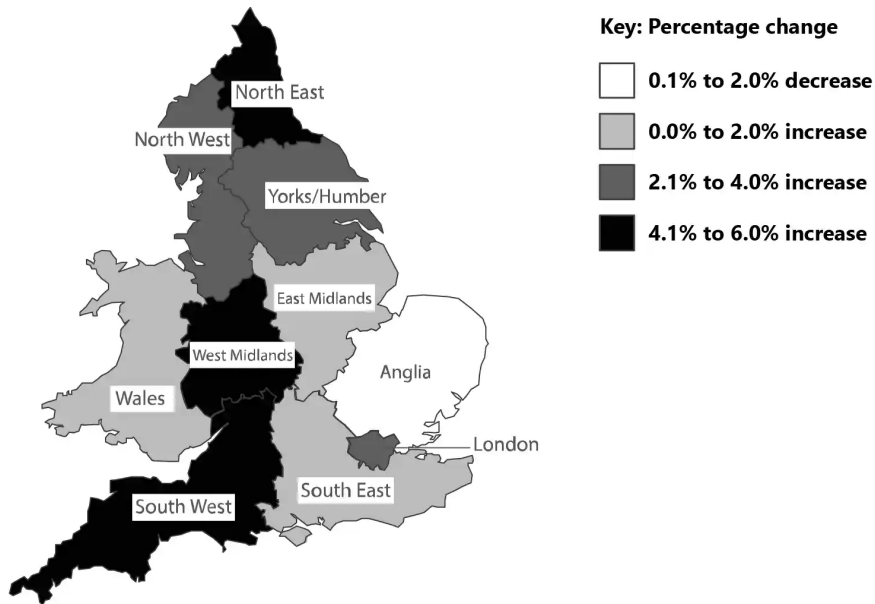
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2 The map below shows the percentage change in domestic tourist visits across different regions of England and Wales between 2010 and 2011.



(a) Write down the percentage change in domestic tourist visits between 2010 and 2011 in Wales.

(1 mark)

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(b) There are 10 regions shown.  
Find the number of regions that the domestic tourist visits **increased**.

(1 mark)

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**(c)** Bryant states that domestic tourism in England and Wales increased overall between 2010 and 2011.

Explain why this may not be the case.

(1 mark)

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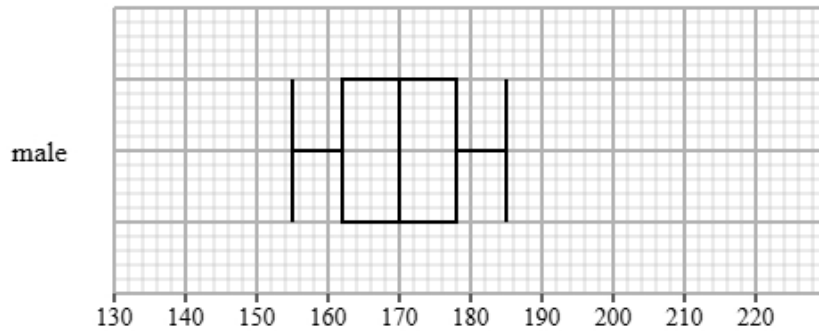
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**(d)** State the statistical name for the type of map shown.

(1 mark)

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- 3 Sophie recorded the heights of male and female students in a school. Both groups were measured using the same method. The box plot shows information about the heights for the male students.

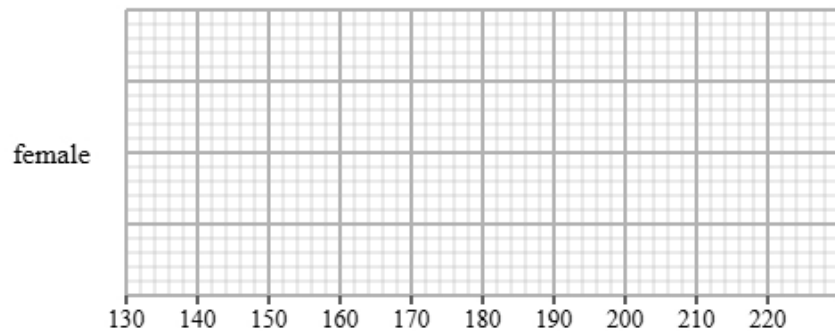


The table gives information about the heights for the female students.

Least tall	Lower quartile	Median	Upper quartile	Most tall
150	158	162	172	190

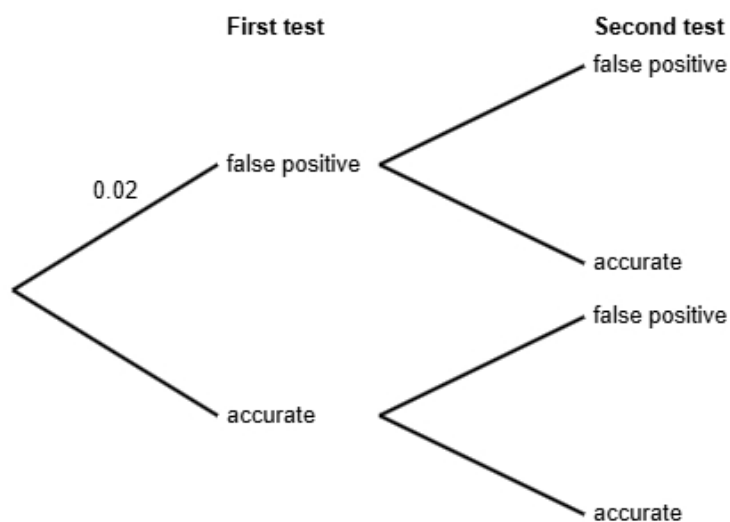
- (a) Draw a box plot for the heights for the female students.

(2 marks)





- 4 It is estimated that 2% of a certain type of medical test gives a false positive result. The remaining tests provide accurate results. David took two such tests. He does not know if each test result is false positive or accurate.



- (a) Complete the probability tree diagram.

(2 marks)

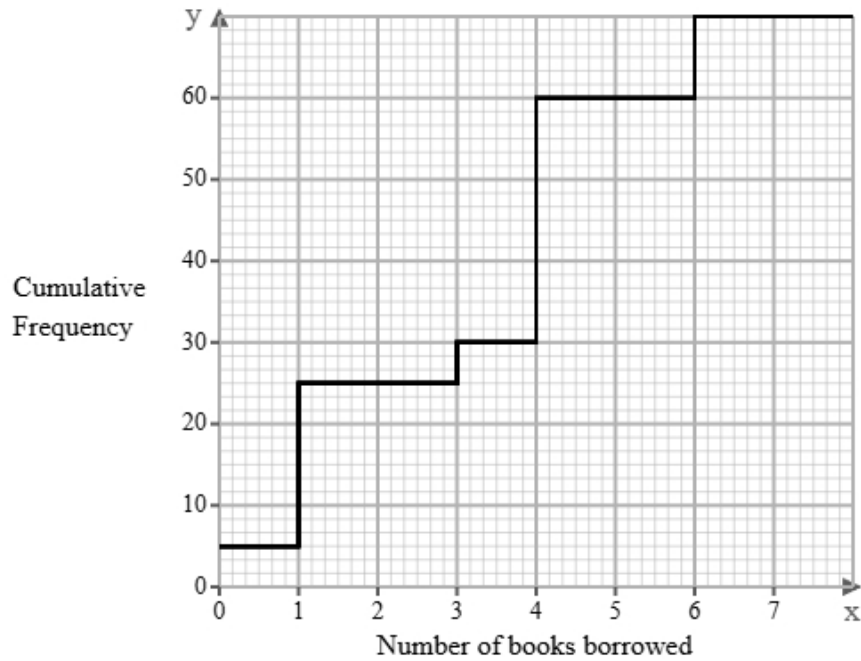
- (b) Find the probability that both of David's test results are accurate.

(2 marks)

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- 5 The cumulative frequency step polygon shows information about the number of books borrowed from a local library over 70 days.



- (a) Give a reason why a cumulative frequency step polygon has been used to display this data.

(1 mark)

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- (b) Find the mode of the number of books borrowed.

(1 mark)

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(c) Find the number of days where there were:

- i) exactly 2 books borrowed.
- ii) more than 2 books borrowed.

(3 marks)

i) Exactly 2 books borrowed: \_\_\_\_\_

ii) More than 2 books borrowed: \_\_\_\_\_

(d) In 30 days fewer than  $x$  books were borrowed.

Find the value of  $x$

(1 mark)

\_\_\_\_\_

(e) Laura believes the interquartile range of the number of books borrowed is 8.

Explain why the interquartile range for this data cannot be 8.

(1 mark)

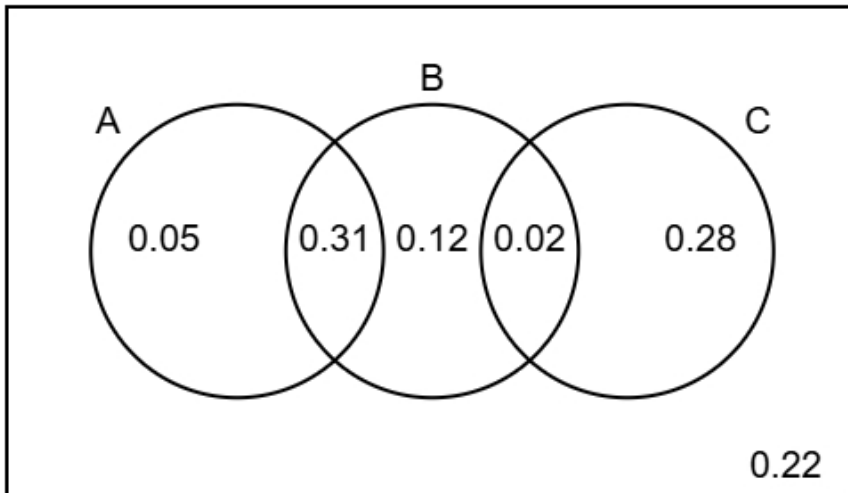
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6 The Venn diagram illustrates the probabilities associated with events A, B, and C.



(a) Identify the **two** events that are mutually exclusive, giving a reason for your answer.

(2 marks)

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(b) Find  $P(B)$

(1 mark)

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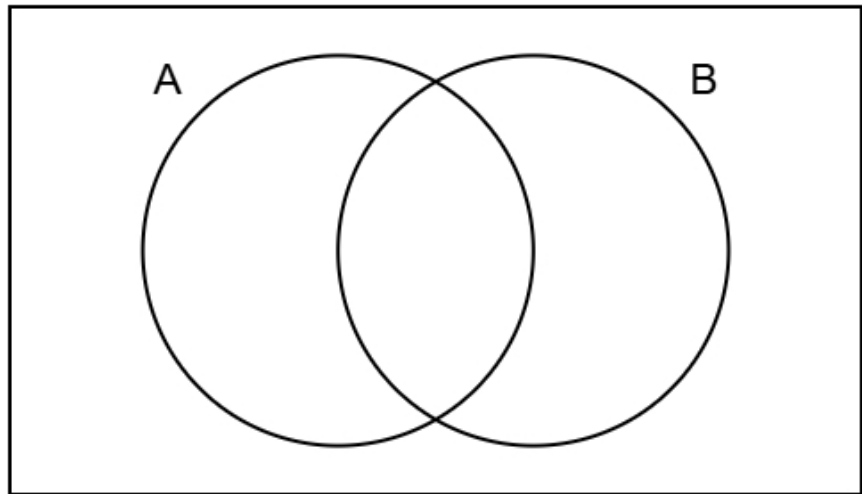
(c) Find  $P(A \text{ or } C)$

(2 marks)

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(d) Complete the Venn diagram to show **only** the probabilities for events A and B.

(2 marks)



7 Ethan is researching the average GCSE grades and their rankings in the local newspaper for 10 schools.

(a) Suggest a diagram that Ethan could draw to determine if there is a relationship between the average GCSE grades and their rankings in the local newspaper for the 10 schools.

(1 mark)

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- (b) i) Calculate Spearman's rank correlation coefficient from the table.  
 ii) Interpret your answer in the context of Ethan's research. You will need to refer to the effects of any outliers.

(5 marks)

School	Mean GCSE Grade	GCSE Grade Rank	Newspaper Rank	d	d <sup>2</sup>
Brookside High	4.8	7	9	-2	4
Cedar Hill Secondary	3.9	8	5	3	9
Eastbank High	6.9	4	6	-2	4
Greystone Academy	7.2	2	1	1	1
Maple Grove School	7.1	3	3		
Northwood School	3.5	9	8		
Pinecrest School	3.1	10	10		
Riverview School	5.6	5	4		
Silverleaf Academy	5.2	6	7		
Westfield High	7.9	1	2		

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(c) Discuss whether Ethan should have used Pearson's product moment correlation coefficient instead of Spearman's rank correlation coefficient to measure the correlation.

(3 marks)

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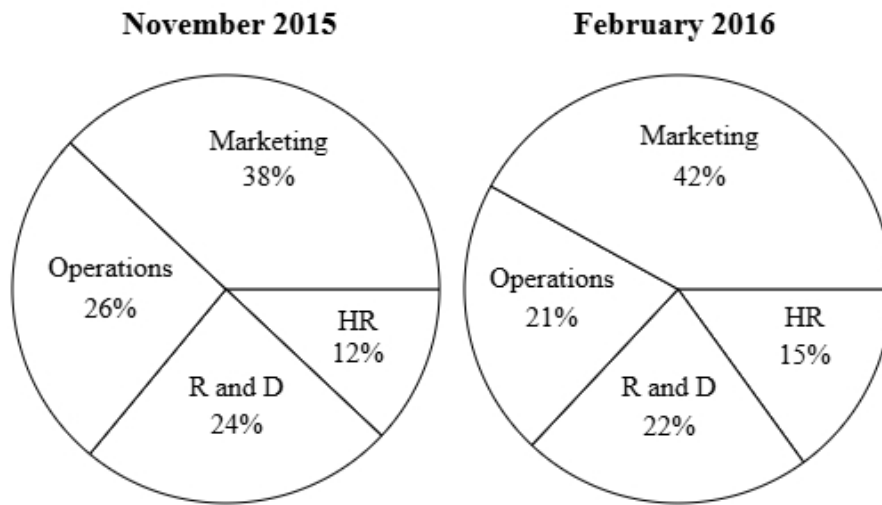
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8 The pie charts show the budget allocations for a business in November 2015 and February 2016.



(a) Explain why the pie charts do not show a larger marketing spend in February 2016 compared to November 2015.

(1 mark)

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(b) The marketing budget in November 2015 was £58748.  
Find the R and D budget in November 2015.

(2 marks)

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**9** A company bottles soft drinks.

The bottles have a target volume of 500 ml.

The company uses quality assurance to monitor the volume of soft drink in each bottle.

Samples of the bottles are taken from the production line at regular intervals and the mean volume of soft drink in the bottles in each sample is found.

The sample means should be normally distributed with a mean of 500 ml and a standard deviation of 3 ml.

**(a)** Find the upper action limit for the sample means for the bottles.

(2 marks)

\_\_\_\_\_ ml

**(b)** The upper action limit will be set closer to the target volume of 500 ml.

Describe the effect this will have on the frequency of production process stoppages.

(1 mark)

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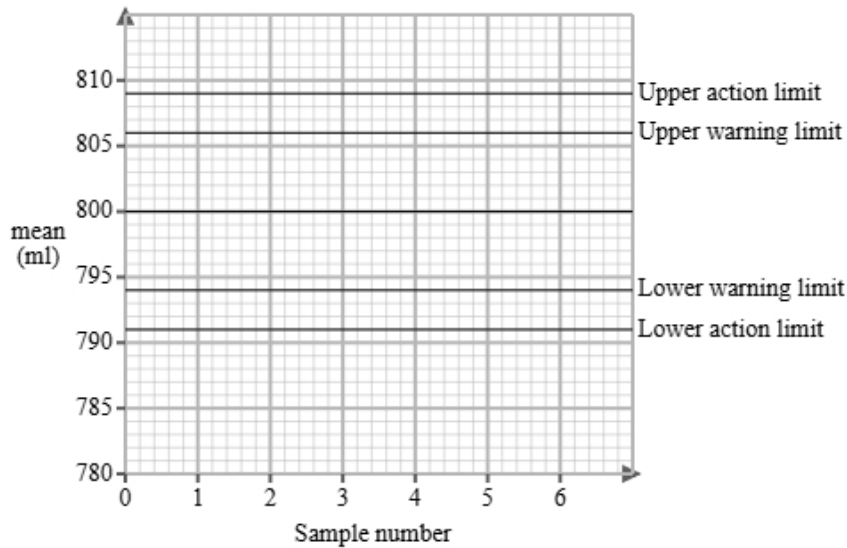
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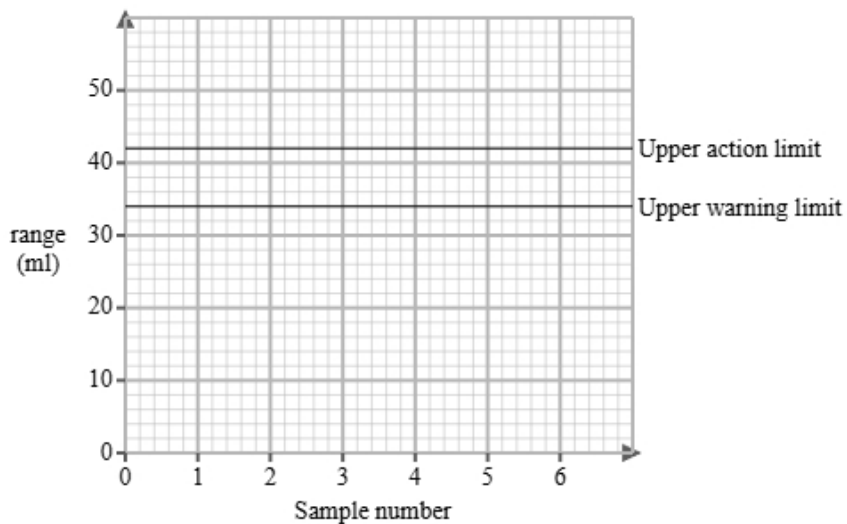
(c) The company also bottles tomato ketchup and uses quality assurance to monitor the volume of tomato ketchup in those bottles.

Here are the control charts for the sample means and for the sample ranges of the volumes of tomato ketchup in the bottles.

**Control chart for means**



**Control chart for ranges**



A sample is taken and is found to have a mean of 807 ml and a range of 43 ml. Use the sample mean and range to determine what action, if any, needs to be taken.

(2 marks)

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**10** The ages of a group of boys have a mean of 5.6 years and a standard deviation of 0.8 years.

**(a)** Liam is boy with a standardised score of 0.  
Find Liam's age.

(1 mark)

\_\_\_\_\_ years

**(b)** Daniel and Alex are both boys in the group.  
Daniel's standardised score for age is 0.9 years.  
Alex's standardised score for age is -0.5 years.  
Daniel is older than Alex.  
How much older is Daniel?

(3 marks)

\_\_\_\_\_ years



**11** A study took place in Sweden to find if there was a relationship between daily exercise and resting heart rate of middle-aged men.

The researchers found the equations of the regression lines for the relationship between daily exercise ( $x$  minutes) and resting heart rate ( $y$  bpm) for gym members and non-gym members on weekdays and weekends.

The table below gives the equations of the regression lines.

	weekdays	weekends
gym members	$y = -0.3x + 72$	$y = -0.25x + 75$
non-gym members	$y = -0.1x + 78$	$y = -0.05x + 80$

**(a)** Interpret in context the figure  $-0.05$  in the regression equation for non-gym members at weekends.

(1 mark)

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**12** 20% of the emails a user receives are spam emails.  
Out of 3 incoming emails, the number of spam emails is recorded.

**(a)** Identify two conditions needed so that a binomial distribution is a suitable model for the number of spam emails in the incoming emails.

(2 marks)

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**(b)** Calculate the probability, as a fraction, that all 3 of the incoming emails are spam.

(2 marks)

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**(c)** Calculate the probability, as a fraction, that at least 2 of the incoming emails are spam.

(3 marks)

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