

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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# GCSE MATHEMATICS

# H

Higher Tier Unit 1 Statistics and Number

Wednesday 4 November 2015

Morning

Time allowed: 1 hour

## Materials

For this paper you must have:

- a calculator
- mathematical instruments.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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.

## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 54.
- The quality of your written communication is specifically assessed in Questions 6 and 8. These questions are indicated with an asterisk (\*).
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

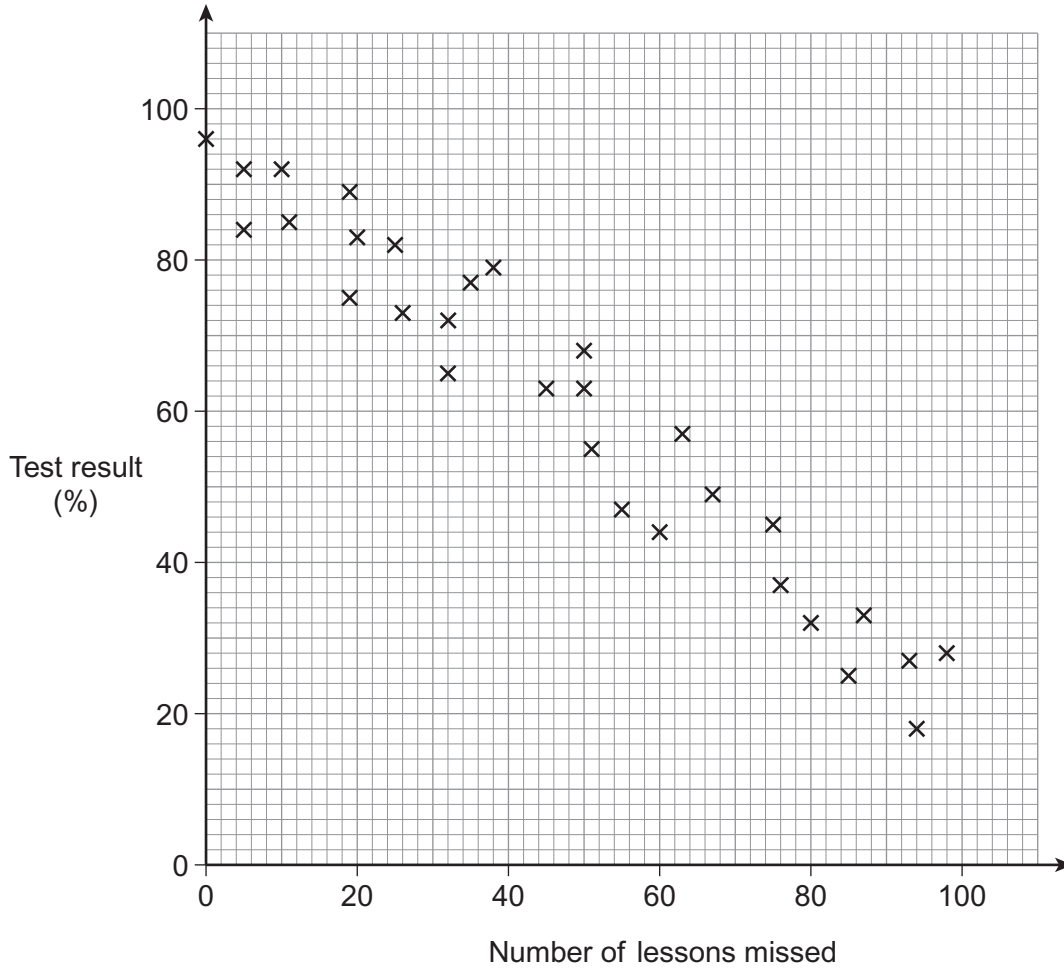
## Advice

- In all calculations, show clearly how you work out your answer.



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

- 1** A teacher recorded the number of lessons missed by 30 students. She compared the number of lessons they missed with their results in a test.



- 1 (a)** What type of correlation is shown?

**[1 mark]**

Answer .....



1 (b) Draw a line of best fit on the graph. [1 mark]

1 (c) Another student missed 40 lessons.  
Use your line of best fit to estimate her test result. [1 mark]

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Answer ..... %

2 (a) An ordinary, fair dice is rolled 420 times.  
How many times is the number 3 expected? [2 marks]

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Answer .....

2 (b) A biased dice is rolled 50 times.  
The number 5 appears 23 times.  
Which of the following give the relative frequency of the number 5?  
Circle **all** the correct answers. [2 marks]

- |     |                 |      |      |                |     |
|-----|-----------------|------|------|----------------|-----|
| 23% | $\frac{23}{50}$ | 0.23 | 0.46 | $\frac{5}{23}$ | 46% |
|-----|-----------------|------|------|----------------|-----|

**Turn over for the next question**



3 40 students have brown, blue or green eyes.

Half of the students with brown eyes are boys.  
There are 6 more girls than boys altogether.

	Boys	Girls	Total
Brown			18
Blue	3		
Green		2	
Total			40

What percentage of the students have blue eyes?

[4 marks]

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Answer ..... %



4 Ben wants to find out which type of music people prefer.  
He surveys 10 boys in his class.

Write down **one** way that Ben can improve his survey.

[1 mark]

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5 There are 20 coloured balls in a bag.  
The probability of choosing a red ball at random is  $\frac{1}{4}$   
One more red ball is added.

Work out the **new** probability of choosing a red ball.

[2 marks]

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Answer .....

**Turn over for the next question**



\*6 Two boxes contain a mix of apples and oranges.

In box A, the ratio of apples to oranges is 5 : 7

In box B,  $\frac{2}{5}$  of the fruit are apples.

A piece of fruit is chosen at random from each box.

Is there a greater probability of choosing an apple from box A or box B?  
You **must** show your working.

**[2 marks]**

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7 A page in a book has 31 sentences.  
The number of words in each sentence is recorded.

Number of words	Midpoint	Frequency	
3 – 5		4	
6 – 8		13	
9 – 13		8	
14 – 18		5	
19 – 25		1	
		<b>Total = 31</b>	

Calculate an estimate for the mean number of words per sentence.  
You **must** show your working.

[3 marks]

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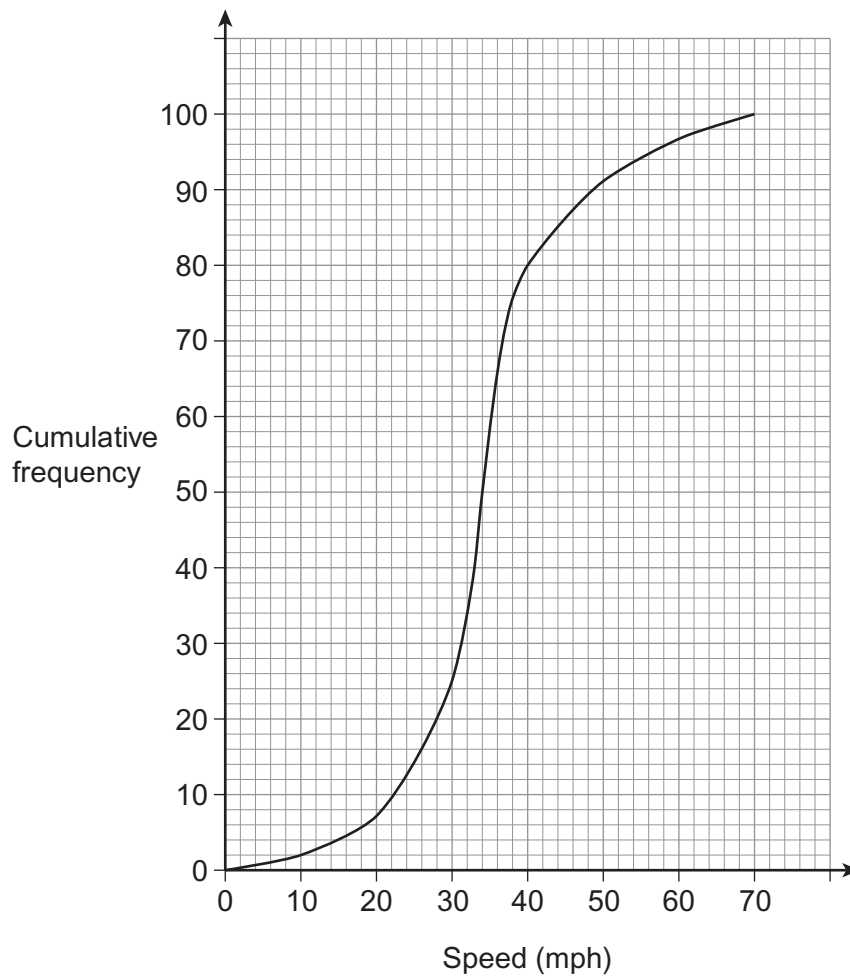
Answer .....

5
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Turn over ►



- 8** The diagram shows information about the speeds of 100 cars.  
The fastest car had a speed of 70 mph



- 8 (a)** How many cars were travelling above 40 mph?  
Circle your answer.

**[1 mark]**

20

33

37

80

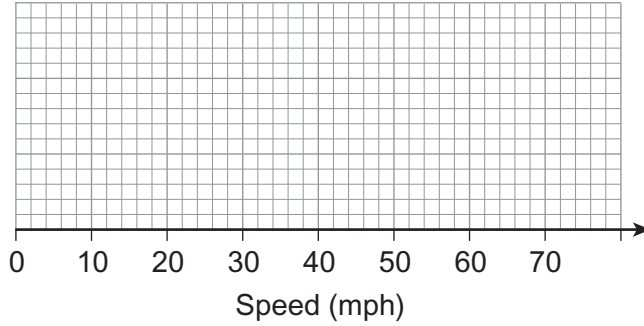




**\*8 (b)** The slowest speed was 5 mph  
The fastest speed was 70 mph

Draw a box plot for the speeds of the 100 cars.

**[3 marks]**



**9** Three positive whole numbers have a mean of 6

What is the greatest possible range of the three numbers?

**[3 marks]**

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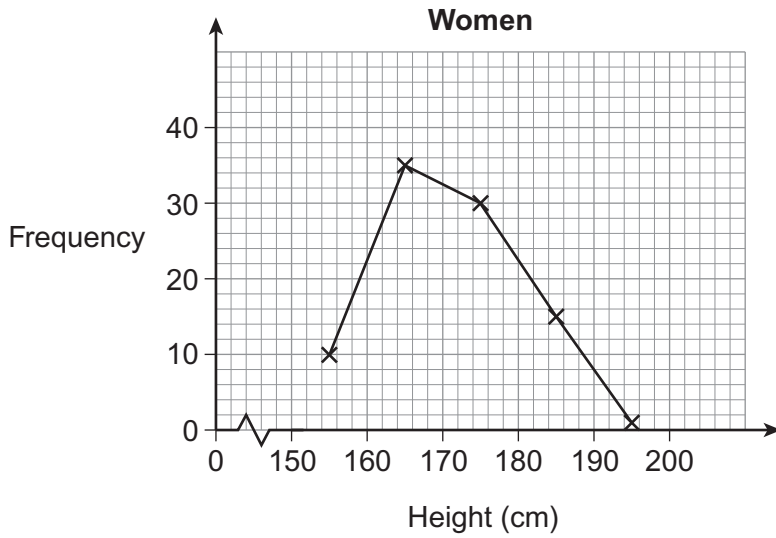
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Answer .....



10 The frequency polygon shows information about the heights of some women.



The table shows information about the heights of some men.

**Men**

Modal class	$170 \text{ cm} < h \leq 180 \text{ cm}$
Range	22 cm

10 (a) Are the women or men taller on average?  
You **must** show your working.

[1 mark]

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10 (b) Are the heights of the women or the men more consistent?  
You **must** show your working.

[2 marks]

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**11** A price is **decreased** by 27%  
The new price is £1138.80  
Work out the original price.

**[3 marks]**

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Answer £ .....

**12** Ten people move house.  
Here is a list of how far, in kilometres, their new house is from their old house.

6 12 7 11 10 9 3420 8 2 9

Which average would **not** be appropriate to use in this situation?  
Give a reason for your answer.

**[2 marks]**

Answer .....

Reason .....

8

Turn over ►



**13 (a)** The probability of winning a game is  $6.4 \times 10^{-3}$

Write this probability as a fraction in its simplest form.

**[2 marks]**

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Answer .....

**13 (b)** The probability of winning a different game is  $1.5 \times 10^{-2}$   
The game is played twice.

Work out the probability of winning this game both times.  
Give your answer in standard form.

**[2 marks]**

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Answer .....



- 14 A swimming club has 500 members.

		Gender		
		Male	Female	Total
Age group	Children	45	33	78
	Adults	130	292	422
	Total	175	325	500

The club chairman wants to survey 60 members.

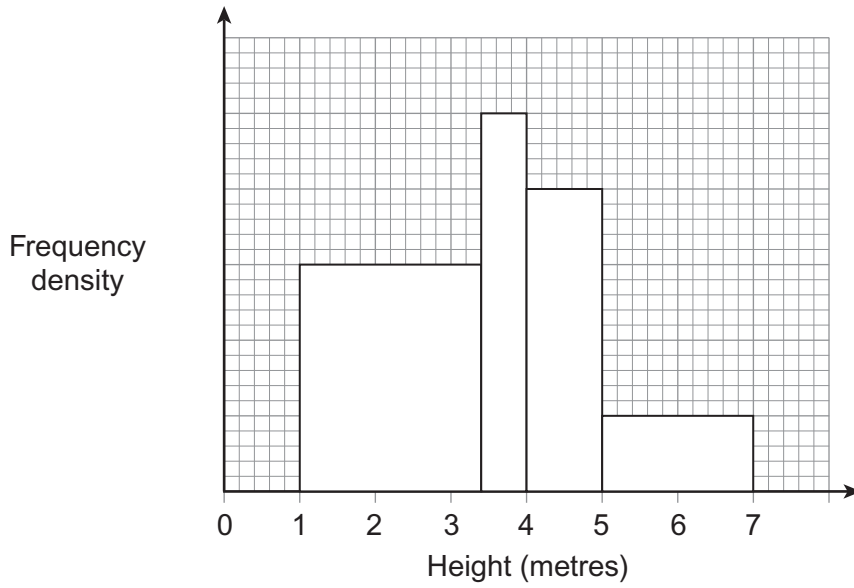
Complete the table below for a sample stratified by age group and gender.

[3 marks]

		Gender		
		Male	Female	Total
Age group	Children			
	Adults			
	Total			60



15 The histogram shows information about the heights of 81 trees.  
The scale on the frequency density axis is missing.



15 (a) How many trees does the first bar represent?  
You **must** show your working.

[4 marks]

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Answer .....



15 (b) What **fraction** of the trees have heights greater than 4 metres?

[2 marks]

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Answer .....

16 A baker has some bread mixture to make rolls.

The mixture weighs 7000 grams, to the nearest 10 grams.  
Each roll uses 48 grams, to the nearest gram.

Work out the greatest number of rolls that the baker can be **certain** of making.  
You **must** show your working.

[3 marks]

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Answer .....



17 There are 7 white socks and 4 black socks in a drawer.  
Two socks are taken out at random without replacement.

Work out the probability that the two socks are the **same** colour.

[4 marks]

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Answer .....

**END OF QUESTIONS**

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