

Centre Number						Candidate Number				
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Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
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12 – 13	
TOTAL	



General Certificate of Secondary Education
Higher Tier
June 2013

Mathematics

43601H

Unit 1

Monday 17 June 2013 9.00 am to 10.00 am

H

For this paper you must have:

- a calculator
- mathematical instruments.



Time allowed

- 1 hour

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this 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.

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 2 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.



J U N 1 3 4 3 6 0 1 H 0 1

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

1 A restaurant owner gives this survey to her customers.

Question: How many take-aways did you have last month?

Response:
Tick a box

5 to 10

10 to 15

15 to 20

over 20

Write **two** criticisms of the response section.

Criticism 1

Criticism 2

(2 marks)



*2 On average it takes 47 lessons to pass the driving test.

Driving school A
First 5 lessons £75
then £21 per lesson

Driving school B
Normal price £23 per lesson
Special offer
15% off normal price

Which is cheaper for 47 lessons?
You **must** show your working.

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Answer (5 marks)

7

Turn over ►



3 (a) Here is information about animals in a rescue centre.

- Half of the dogs are male.
- 25% of the rabbits are female.
- There are 20 more males than females altogether.

Complete the two-way table.

	Dog	Cat	Rabbit	Total
Male				
Female				
Total	42	18	20	80

(4 marks)

3 (b) 42 of the 80 animals are dogs.

What percentage of the animals are dogs?

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Answer % (2 marks)



4 A researcher wants to compare the ages of viewers of BBC 1 and Sky 1.

4 (a) Write a suitable hypothesis.

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(1 mark)

4 (b) He writes a plan to investigate the hypothesis.

Use the Data Handling Cycle to put his plan in the correct order.

- A Work out the mean age for each channel.
- B Select some television viewers to ask.
- C Compare the results and comment on the hypothesis.
- D Collect data about the ages of the television viewers.

Answer , , , (2 marks)

Turn over for the next question



5 Chen records his journey times to college.

Time, t (minutes)	Frequency
$25 < t \leq 30$	12
$30 < t \leq 35$	18
$35 < t \leq 40$	24
$40 < t \leq 45$	6
	Total = 60

5 (a) Calculate an estimate of his mean journey time.

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Answer minutes (4 marks)

5 (b) Explain why your answer to part (a) is an estimate.

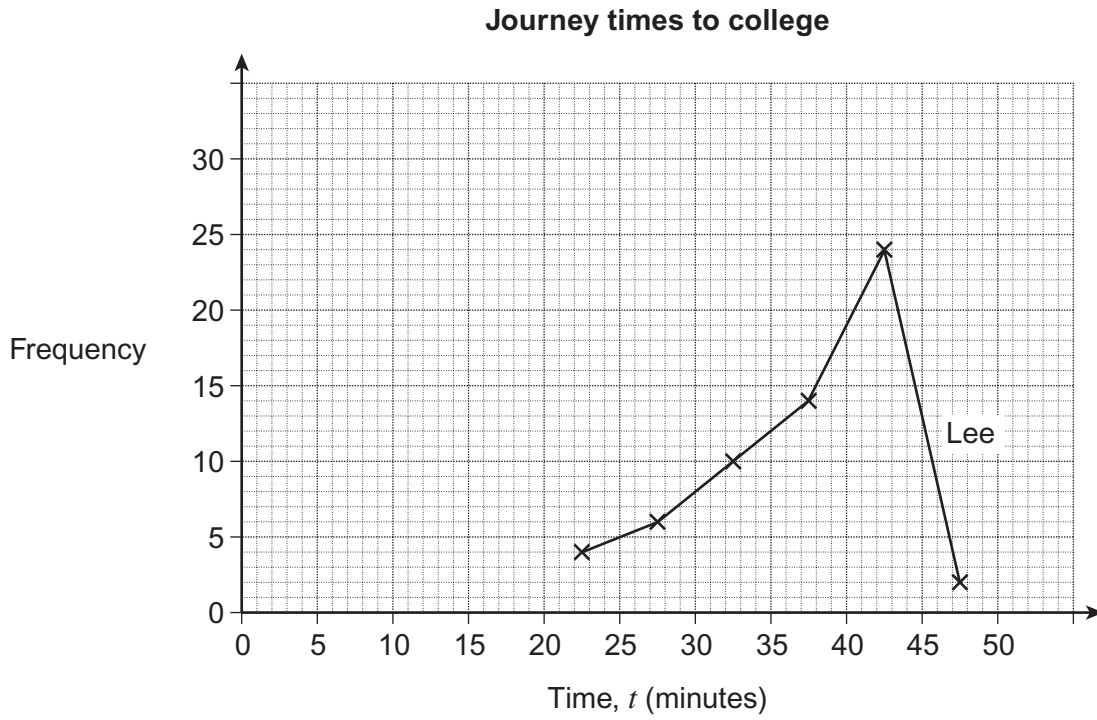
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(1 mark)



5 (c) The frequency polygon shows Lee's journey times to college.



On the same grid, draw a frequency polygon for Chen's journey times.

(2 marks)

5 (d) An estimate of Lee's mean journey time is 37 minutes.

Compare the journey times for Lee and Chen.

Comparison 1

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Comparison 2

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(2 marks)



- 6** A play area has thousands of coloured balls.
They are white, pink or yellow.

Sam picks 10 balls at random.
The table shows some of her results.

	white	pink	yellow
Frequency	4		
Relative frequency		0.1	

- 6 (a)** Complete the table.

(3 marks)

- 6 (b)** Sam uses her results to estimate the proportion of white balls in the play area.

How could she make her estimate more reliable?

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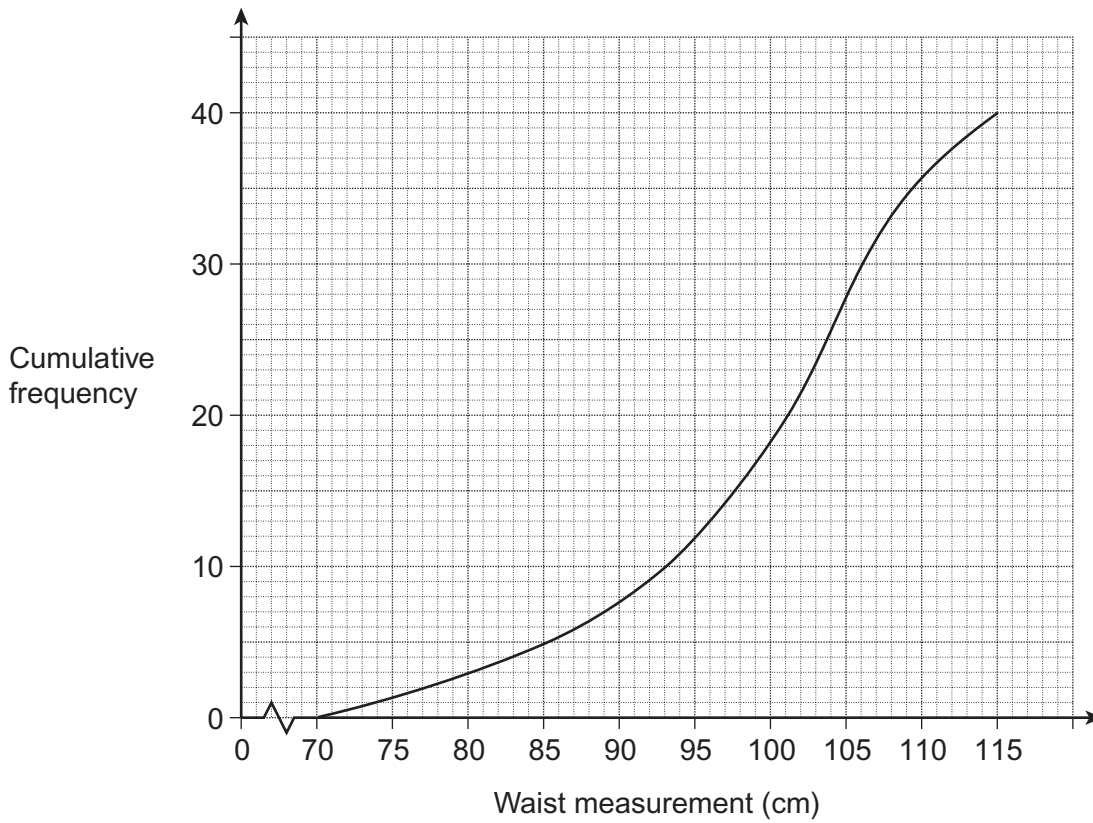
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(1 mark)



7

Waist measurements of 40 men



7 (a) How many men have a waist measurement of 85 cm or less?

Answer (1 mark)

7 (b) What is the median waist measurement?

Answer cm (1 mark)

7 (c) What is the interquartile range of the waist measurements?

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Answer cm (2 marks)



8 There were 17 million families in the UK in 2006.

***8 (a)** The mean number of children per family was 1.8

How many children were there in the UK?
Give your answer in standard form.

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Answer (2 marks)

8 (b) The total income of families in the UK was $\text{£ } 5.6 \times 10^{11}$

What was the mean income per family?
Give your answer to an appropriate degree of accuracy.

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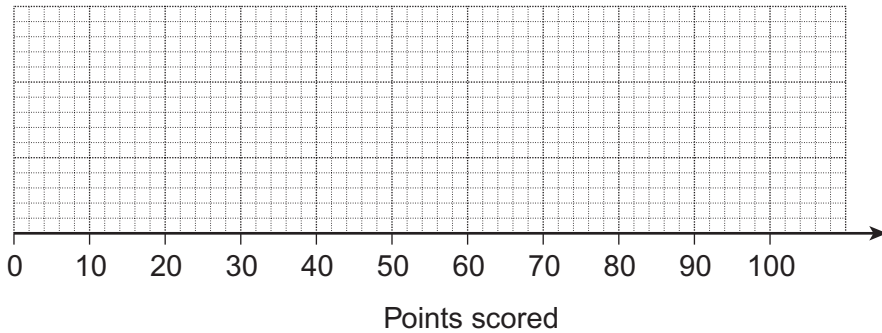
Answer £ (3 marks)



9 (a) Here is some information about the points scored in a quiz.

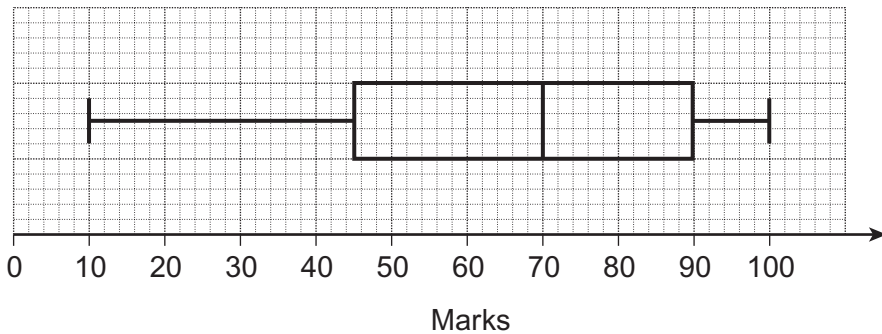
Minimum	Lower quartile	Median	Upper quartile	Maximum
15	20	50	80	90

Show this information on a box plot.



(2 marks)

9 (b) This box plot represents the marks gained by students in an exam.



Nobody gained exactly 45, 70 or 90 marks.
120 students gained **less than** 90 marks.

How many students gained **more than** 70 marks?

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Answer (3 marks)

10

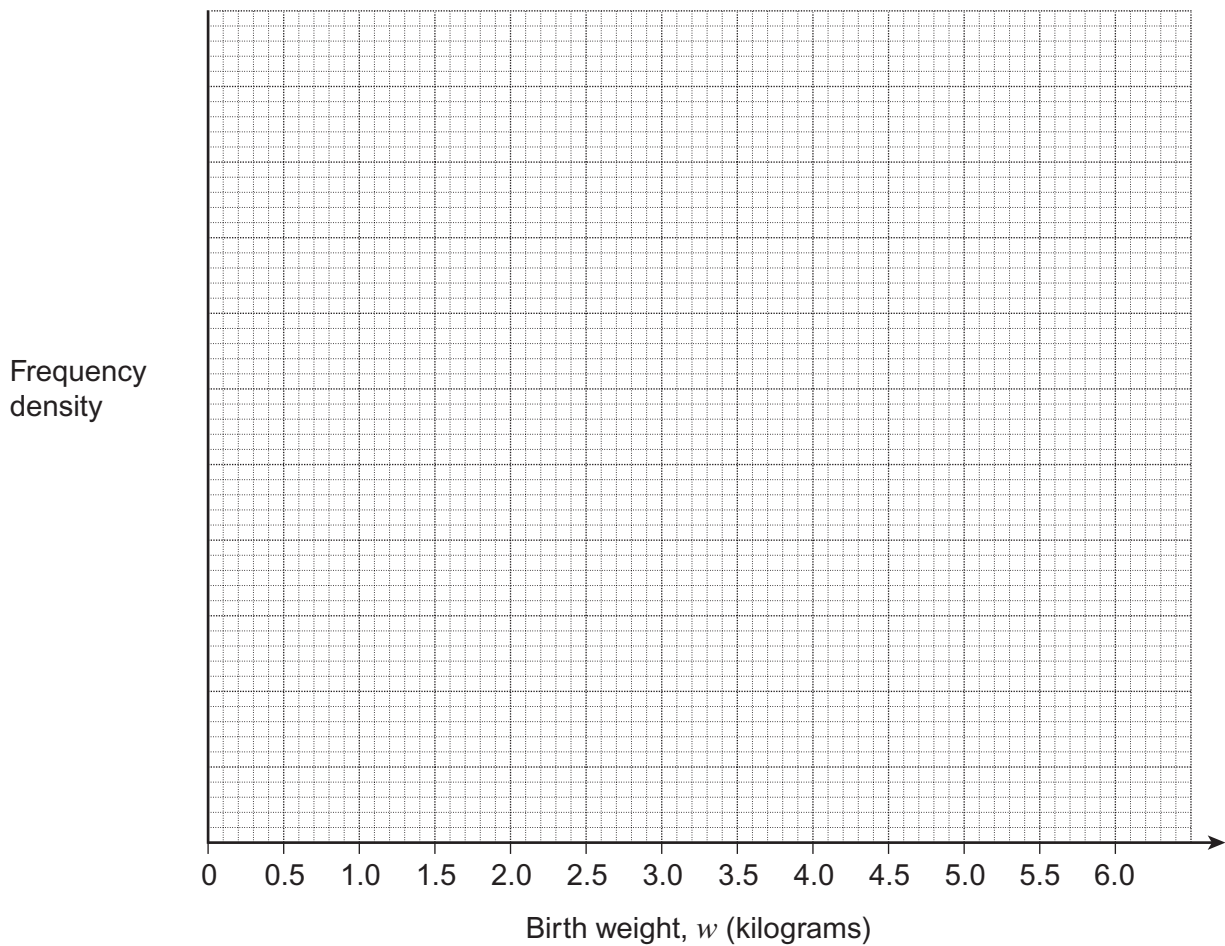
Turn over ►



- 10 The grouped frequency table represents the birth weights of 1000 babies.

Birth weight, w (kilograms)	Frequency
$1.0 \leq w < 2.5$	45
$2.5 \leq w < 3.5$	490
$3.5 \leq w < 4.5$	270
$4.5 \leq w < 6.0$	195

- 10 (a) Show the data on a histogram.



(4 marks)



10 (b) Babies under 2.5 kg have a low birth weight.

Two of the 1000 babies are chosen at random.

Work out the probability that **both** babies have a low birth weight.
You **must** show your working.

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Answer (3 marks)

11 A home gym can take a maximum load of 145 kg of weight plates.
Each weight plate is 10 kg to the nearest kilogram.

Work out the **greatest** number of weight plates that can be safely loaded on the gym.
You **must** show your working.

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Answer (4 marks)

END OF QUESTIONS



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