Centre Number						Candidate Number				
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For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16	
TOTAL	

General Certificate of Secondary Education
Higher Tier
June 2015

Mathematics 43601H

Unit 1

H

Thursday 11 June 2015 1.30 pm to 2.30 pm

For this paper you must have:
- a calculator
- mathematical instruments.

Time allowed
- 1 hour

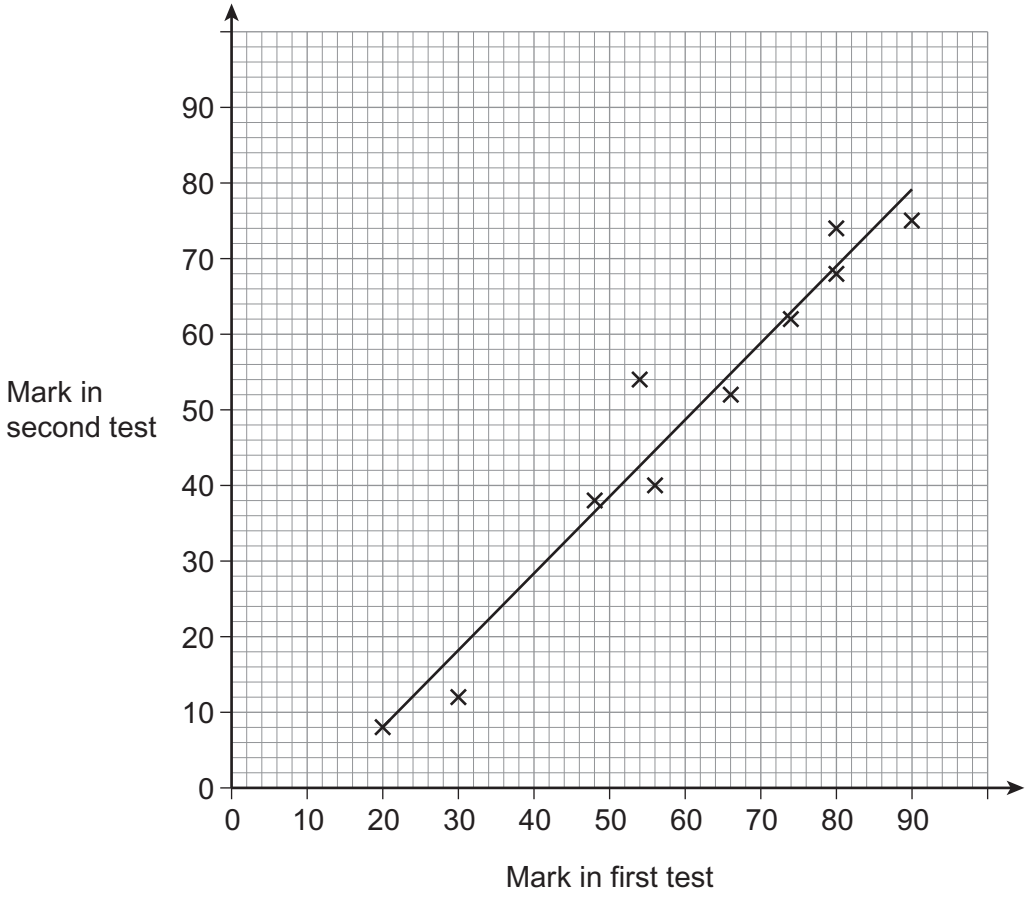
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this 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 12. 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 The scatter graph shows information about the marks of 10 students in two tests.



1 (a) Describe the correlation.

[1 mark]

Answer .....

1 (b) A student scored 40 in the first test.

Estimate her **total** for both tests.

[2 marks]

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Answer .....

2 A professor wants to know whether boys or girls are more likely to study Economics.

***2 (a)** Write a suitable hypothesis.

[1 mark]

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2 (b) He asks some boys and girls if they plan to study Economics.

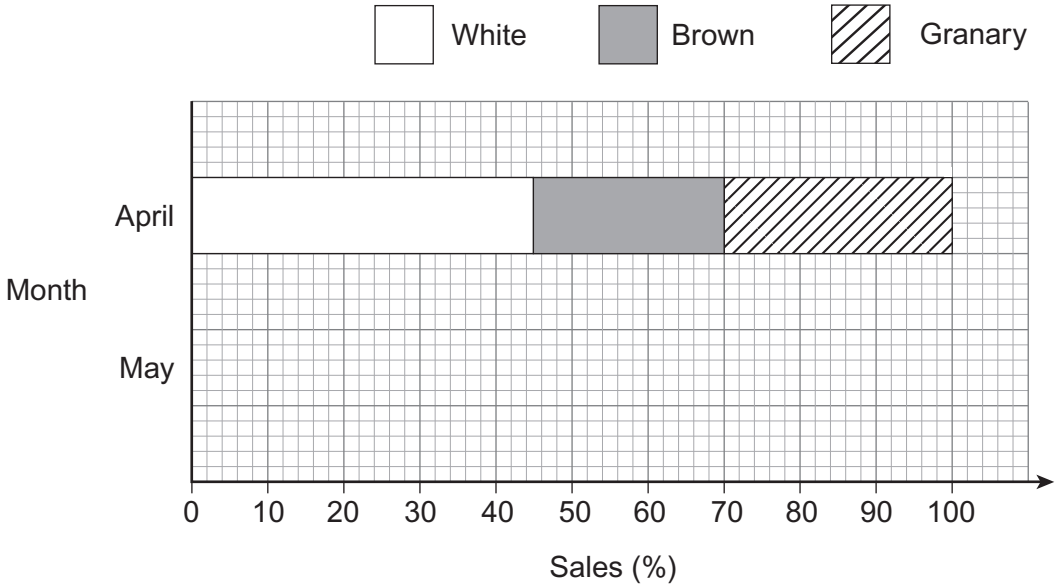
Design a data collection sheet for his results.

[2 marks]

Turn over for the next question

6

3 The chart shows information about sales of loaves of bread at a bakery.



3 (a) Circle the simplest form of the ratio white : brown : granary

[1 mark]

9 : 14 : 20 | 4.5 : 2.5 : 3 | 9 : 5 : 6 | 45 : 70 : 100

3 (b) The table shows the sales for May.

White	Brown	Granary	
3000	1800	1200	Total = 6000

Show this information on the chart.

[3 marks]

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4 A pet shop had 40 rabbits.
22 were male.
The others were female.

The shop sold 10 of the rabbits.

The probability that a rabbit picked at random is male is now $\frac{1}{2}$

How many **female** rabbits were sold?

[3 marks]

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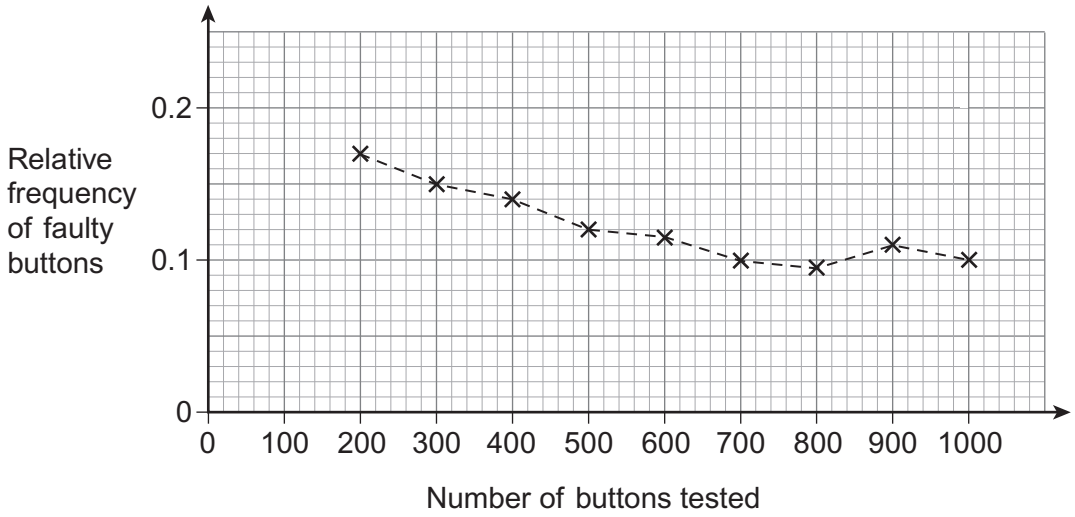
Answer .....

Turn over for the next question

7

5 A machine makes buttons.
The graph shows the relative frequency of buttons that are faulty.



5 (a) 18 of the first 100 buttons are faulty.

Plot the relative frequency on the graph.

[1 mark]

5 (b) One week the machine makes 5000 buttons.

Work out the best estimate of the number of faulty buttons.
Use the graph to help you.

[2 marks]

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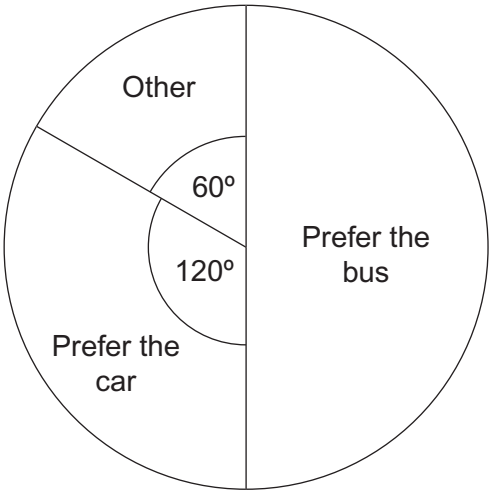
Answer .....

6 In a survey people were asked if they support a new tram system.
Here are the results.

Yes	No
80%	20%

People who said No were asked for a reason.

Reasons people said No



900 people said they prefer the car.

How many people in the survey said Yes?

[4 marks]

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Answer .....

7

7 Five singers took part in a competition.
Viewers voted for their favourite.
The table shows the proportion of the votes for four of the singers.

Singer	Proportion
Ali	0.56
Beth	0.19
Carl	0.14
Dan	0.08
Emma	

7 (a) Complete the table.

[2 marks]

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7 (b) This year there were 9 400 000 votes.
This is an increase of 28% from last year.

Work out the number of votes last year.

[3 marks]

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Answer .....

8 (a) Work out $0.15^2 \times (1 - 0.15)^3$

Give your answer in standard form to 2 significant figures.

[2 marks]

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Answer .....

8 (b) In an experiment

the probability of A is 3.9×10^{-7}
the probability of B is 1.2×10^{-8}

How many times more likely is A than B?

[2 marks]

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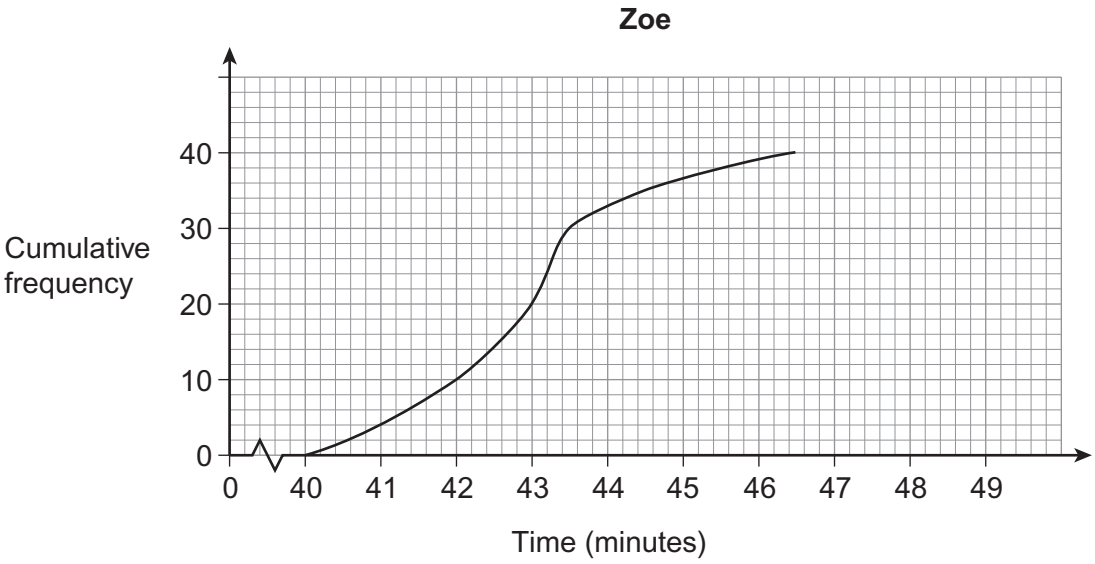
Answer .....

Turn over for the next question

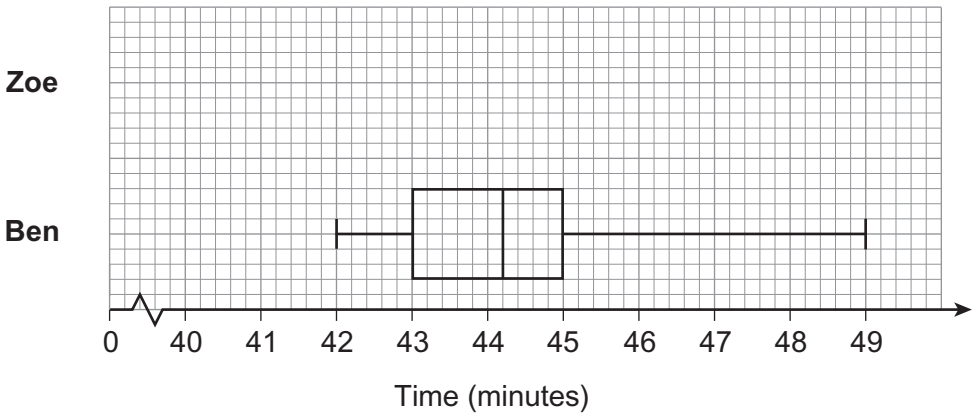
9

Turn over ▶

9 Zoe and Ben record their times in 40 races.
The graph shows information about Zoe's times.



The box plot shows information about Ben's times.



9 (a) Zoe's fastest time was 40 minutes.
Her slowest time was 46.5 minutes.

On the same grid, draw a box plot for Zoe's times.

[3 marks]

9 (b) Who was more consistent?
Give a reason for your answer.

[1 mark]

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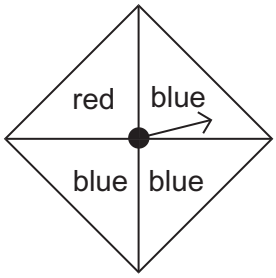
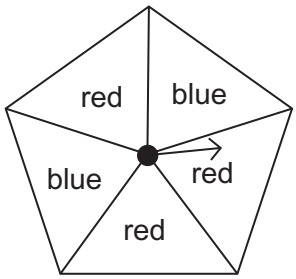
10 Here are two fair spinners.

Spinner A



Spinner B



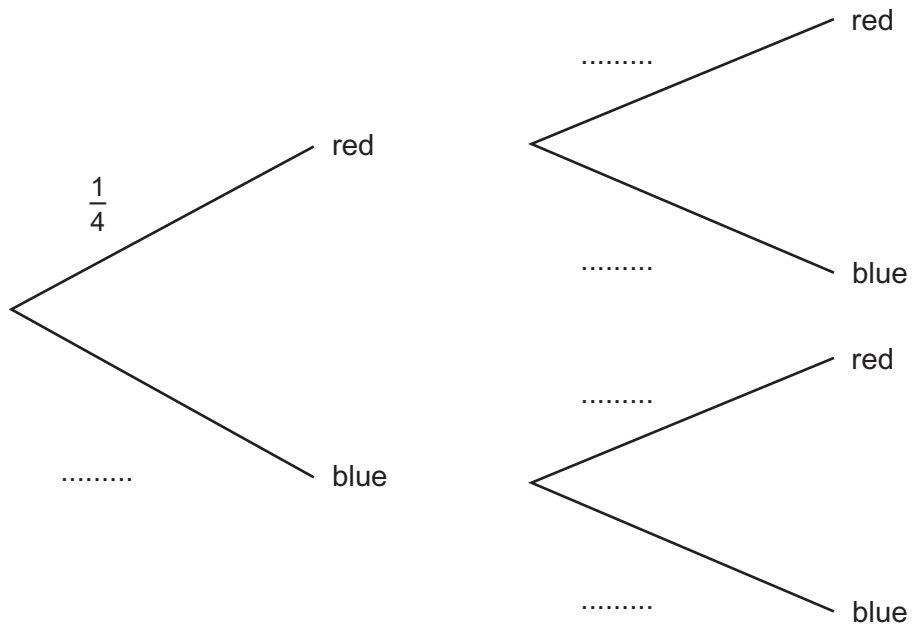
Both arrows are spun.

10 (a) Complete the tree diagram.

[2 marks]

Spinner A

Spinner B



10 (b) Work out the probability that both arrows land on the same colour.

[3 marks]

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Answer .....

9

Turn over ▶

11 The table shows information about the 1200 students in a school.

		School group		
		Main school	Sixth form	
Gender	Boys	440		
	Girls	600		
		1040	160	**Total = 1200**

A teacher sent a questionnaire to a sample of 150 of the 1200 students.
The sample was stratified by gender and school group.

11 (a) How many **boys** in the **main school** were sent the questionnaire?

[2 marks]

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Answer .....

11 (b) The questionnaire was sent to 2 **more** girls in the sixth form than boys in the sixth form.

How many **boys** are there in the **sixth form**?
Assume that the teacher did not need to round any values in the sample.

[3 marks]

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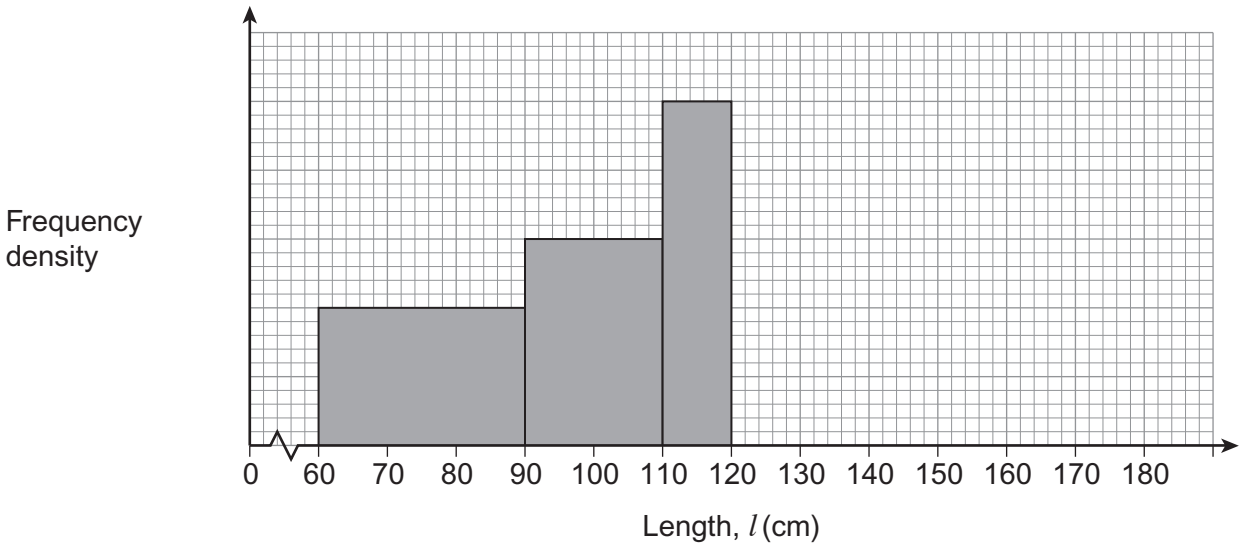
Answer .....

Turn over for the next question

5

***12** The table and histogram give some information about the lengths of 600 ribbons.

Length, l (cm)	Frequency
$60 < l \leqslant 90$	120
$90 < l \leqslant 110$	
$110 < l \leqslant 120$	
$120 < l \leqslant 140$	180
$140 < l \leqslant 180$	80
	Total = 600



Complete the table and the histogram.

[4 marks]

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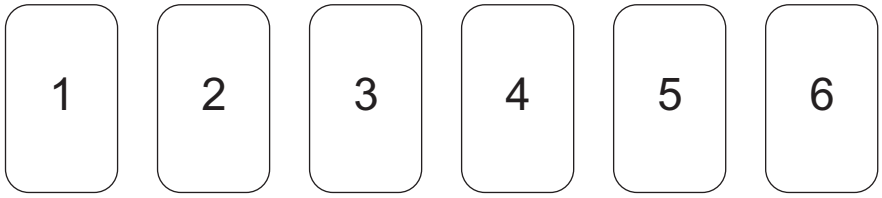
13 These cards are in a hat.



Two of the cards are taken out at random.

Work out the probability that the total of the two cards is 10 or more.

[4 marks]

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Answer .....

Turn over for the next question

8

14 A pan contains 9 litres of jam, to the nearest litre.
Jars hold 0.15 litres each, to 2 decimal places.

Work out the **greatest** number of jars that could possibly be filled with the jam.
You **must** show your working.

[3 marks]

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Answer .....

END OF QUESTIONS

3