Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
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14 – 15	
TOTAL	

General Certificate of Secondary Education
Higher Tier
March 2013

Mathematics 43601H

Unit 1

Thursday 28 February 2013 1.30 pm to 2.30 pm

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 1, 2 and 4. 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 booklet.

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

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

1 The points scored by 20 teams in a competition are shown.

25	33	36	23	35
24	50	37	26	46
48	35	51	28	39
30	48	33	44	25

***1 (a)** Show this data on an ordered stem-and-leaf diagram.
Remember to complete the key.

Key: ..... | ..... represents ..... points

2	.....
3	.....
4	.....
5	.....

(3 marks)

1 (b) Teams that score **more than** 25 points stay in the competition.

What percentage of the teams stay in the competition?

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Answer ..... % *(2 marks)*

Turn over for the next question

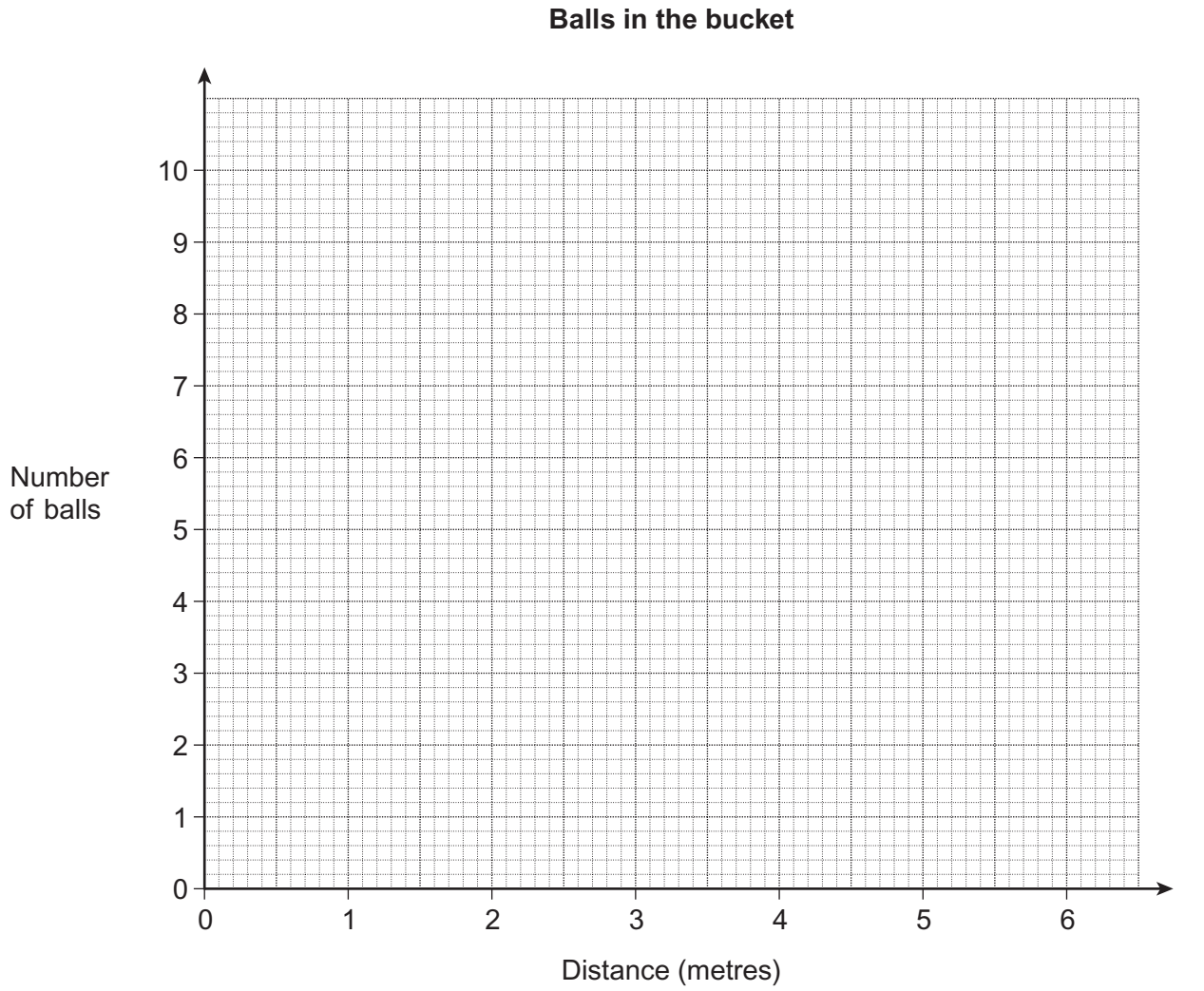
5

2 Matthew tried to throw balls into a bucket from different distances.
He threw 10 balls from each distance.

His results are shown in the table.

Distance (metres)	2.0	2.5	3.2	4.1	4.5	5.3	6.0
Number of balls in the bucket	9	7	8	6	2	4	1

2 (a) Plot these results as a scatter graph.



(2 marks)

2 (b) Draw a line of best fit on your scatter graph.

(1 mark)

***2 (c)** What type of correlation is shown?

Answer ..... *(1 mark)*

2 (d) Matthew is organising a game at the school fayre.

Each player will be given 10 attempts to throw a ball into a bucket.
He wants the average number in the bucket to be 5.

Use your line of best fit to decide how far the bucket should be from each player.

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Answer ..... metres *(2 marks)*

Turn over for the next question

6

3 The table shows the Geography and History grades of 100 students.

Geography \ History	**D**	**C**	**B**	**A**	**A***
D	3	5	1	2	0
C	6	8	4	3	1
B	3	9	5	9	2
A	2	3	8	10	3
A*	0	2	4	5	2

3 (a) How many students have at least one grade A* in these subjects?

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Answer ..... *(2 marks)*

3 (b) How many students have a higher grade in Geography than in History?

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Answer ..... *(2 marks)*

4 Class A had a spelling test of ten words.
The table shows their marks.

Class A

Mark	Frequency	
5	4	
6	2	
7	8	
8	10	
9	6	
	Total = 30	

4 (a) Show that the mean mark is 7.4

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(3 marks)

***4 (b)** Class B had the same test.
The mean mark for Class B is 6.5

The teacher says,

"On average, Class A scored 15% higher than Class B."

Is she correct?
You **must** show your working.

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(3 marks)

10

5 A bag contains only red counters and blue counters.
There are 6 **more** red than blue.

A counter is chosen at random from the bag.

The probability it is blue is $\frac{1}{4}$

How many **red** counters are in the bag?

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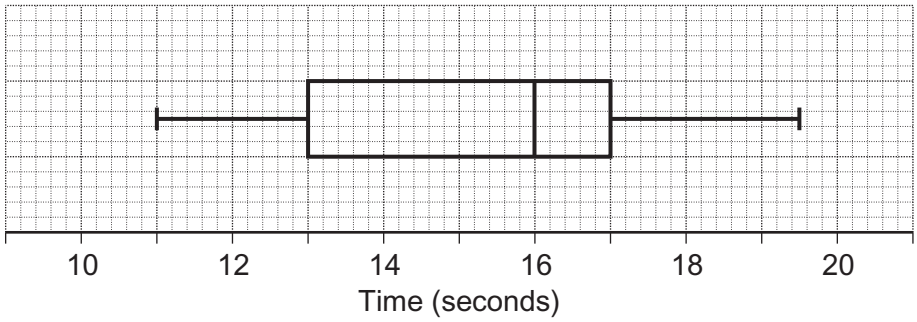
Answer ..... *(3 marks)*

6 Girls and boys are timed in a race.
The box plot shows information about the times for the girls.

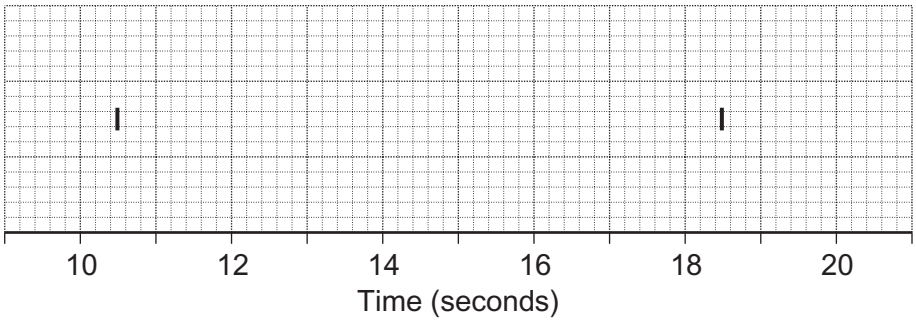
Girls



- 25% of the boys take 12 seconds or less
- The interquartile range for the boys is the same as for the girls
- The ratio of median times is girls : boys = 8 : 7

Complete the box plot for boys on the grid below.
The times for the fastest and slowest boys have been plotted for you.

Boys



(4 marks)

7

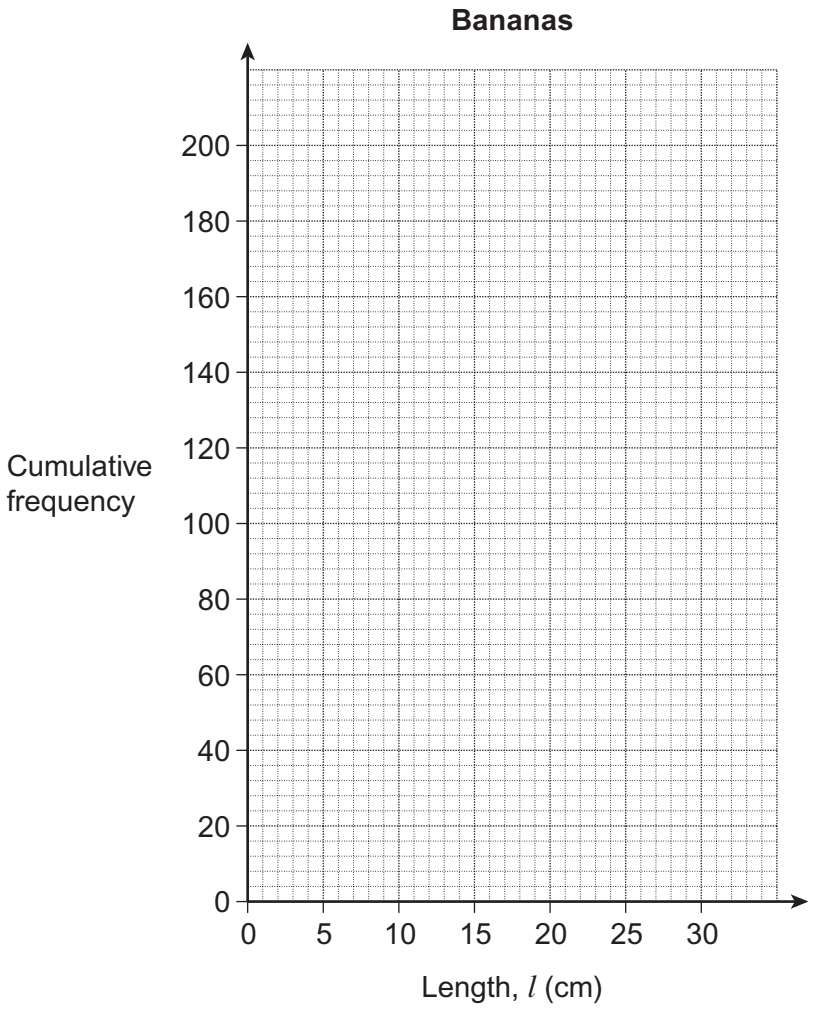
7 The table shows information about the lengths of 200 bananas.

Length, l (cm)	Frequency	Cumulative frequency
$5 < l \leqslant 10$	12	12
$10 < l \leqslant 15$	48	60
$15 < l \leqslant 20$	70	
$20 < l \leqslant 25$	60	
$25 < l \leqslant 30$	10	

7 (a) Complete the cumulative frequency column.

(1 mark)

7 (b) Draw a cumulative frequency diagram for the data.



(3 marks)

7 (c) A shop only buys bananas with lengths between 16 cm and 22 cm.

Estimate the **fraction** of the 200 bananas that the shop buys.

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Answer ..... *(3 marks)*

Turn over for the next question

7

8 A travel company sells holidays.

8 (a) The company sold 1072 UK holidays in 2012.
It expects the number it sells to increase by 12% **each year**.

Work out the number of UK holidays the company expects to sell in 2014.

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Answer ..... *(3 marks)*

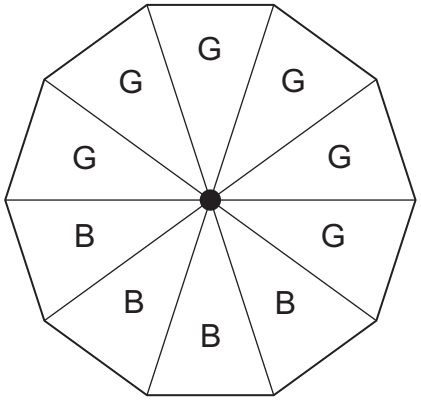
8 (b) The company wants to survey 500 customers, stratified by country visited.

Complete the table.

	UK	**Spain**	**France**	**Italy**	**Total**
Number of customers	1072	2392	316	220	**4000**
Number in sample					**500**

(3 marks)

9 Jack and Lucy each spin this fair 10-sided spinner once.



Key : G = green
B = blue

Jack wins if their colours are the same.
Lucy wins if their colours are different.

Who has the better chance of winning?
You **must** show your working.

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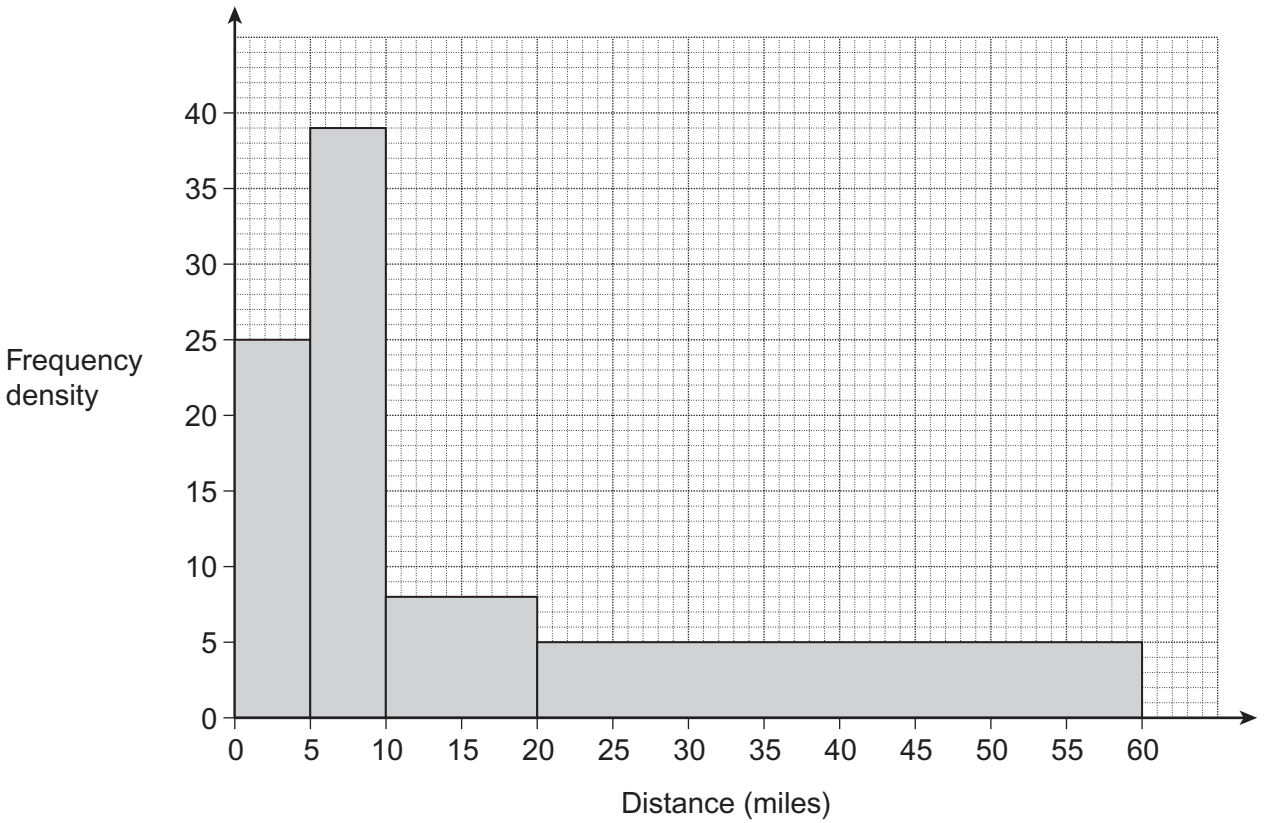
Answer ..... *(3 marks)*

9

Turn over ▶

10 The histogram shows information about the distances 600 people travel to work.



10 (a) How many people travel more than 20 miles to work?

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Answer ..... *(2 marks)*

10 (b) 224 of these people travel further to work than I do.

Estimate the distance I travel to work.

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Answer ..... miles *(4 marks)*

11 A shelf supports 80 kg, to the nearest kilogram.
Bottles weigh 1.4 kg each, to the nearest tenth of a kilogram.

Work out the greatest number of bottles that can definitely be supported by the shelf.

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Answer ..... *(4 marks)*

END OF QUESTIONS

10

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED