Centre Number						Candidate Number				
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Other Names										
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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	
TOTAL	

AQA

General Certificate of Secondary Education
Higher Tier
June 2014

Mathematics 43601H

Unit 1

H

Tuesday 17 June 2014 9.00 am to 10.00 am

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

Time allowed
- 1 hour

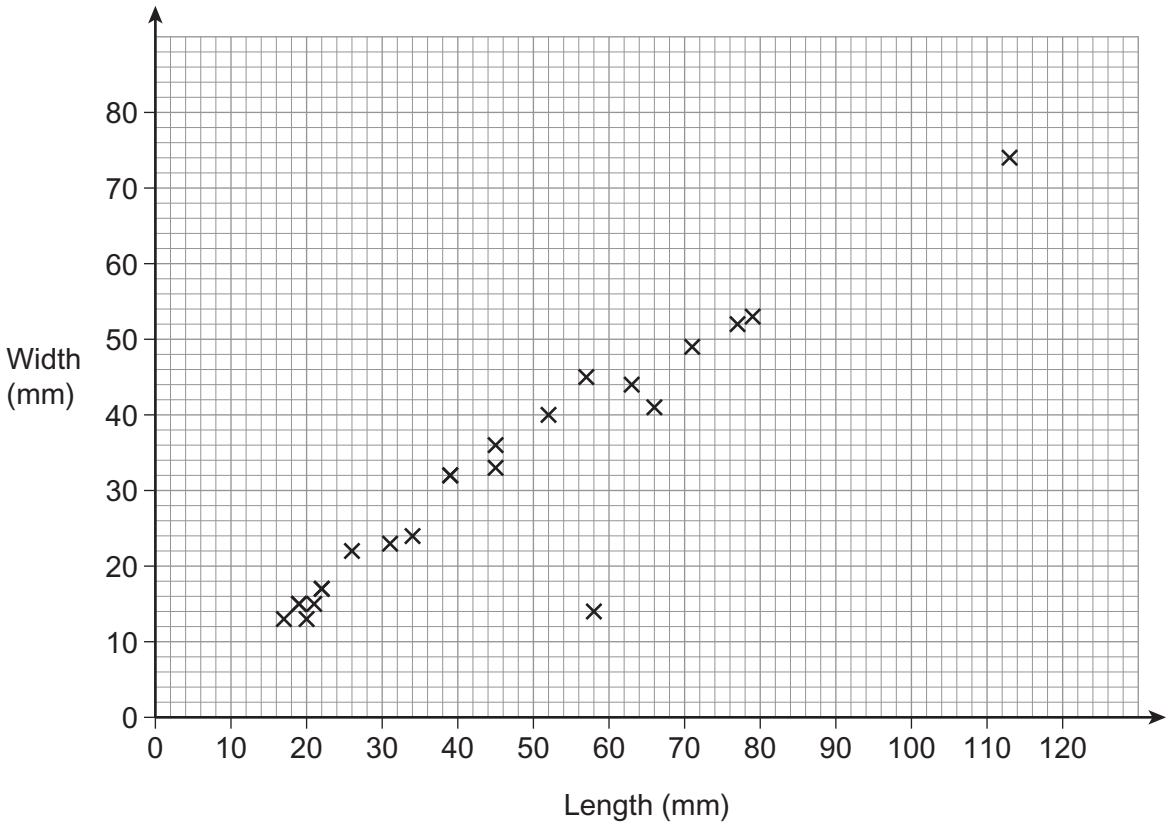
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this 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 3, 6 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 the lengths and widths of 20 birds' eggs.



1 (a) One of the eggs has a length of 52 mm.

What is its width?

[1 mark]

Answer ..... mm

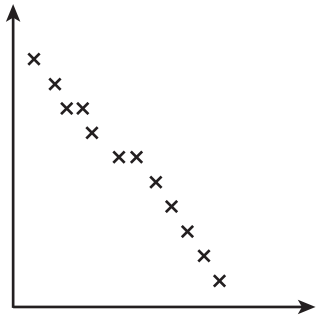
1 (b) All the points except one show strong correlation.

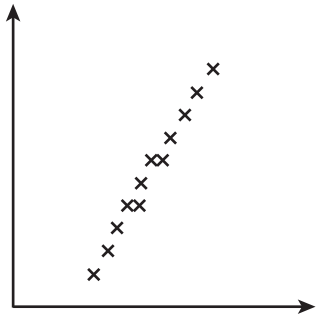
Circle the point that does **not** fit this pattern.

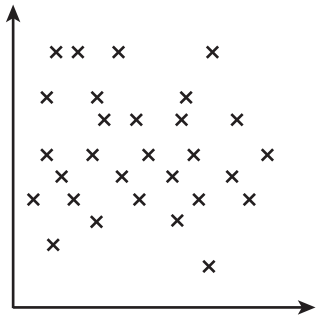
[1 mark]

1 (c) Match each scatter graph with a description.
The first one has been done for you.

[2 marks]







- Strong positive correlation
- Weak positive correlation
- Little or no correlation
- Weak negative correlation
- Strong negative correlation

4

2 This table shows information about the weights of 200 rabbits.

Weight, w (grams)	Frequency	Midpoint	
$60 < w \leqslant 70$	101	65	
$70 < w \leqslant 80$	64	75	
$80 < w \leqslant 90$	25	85	
$90 < w \leqslant 100$	10	95	
	Total = 200		

2 (a) Tick whether each statement is true or false.

[1 mark]

	True	False
You can use the table to calculate the exact median.	☐	☐
You can use the table to work out the weight of the heaviest rabbit.	☐	☐

2 (b) Calculate an estimate of the mean weight of the 200 rabbits.

[3 marks]

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Answer ..... grams

2 (c) Here are the weights, in grams, of 10 more rabbits.

76.2 89.4 93.1 99.7 86.8 79.2 82.6 91.9 88.0 95.4

Complete the table with:

- tallies for these 10 rabbits
- the frequencies for **all** 210 rabbits.

[2 marks]

Weight, w (grams)	**Tally**	**Frequency**
$60 < w \leqslant 70$	𝍸 I	
$70 < w \leqslant 80$	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 IIII	
$80 < w \leqslant 90$	𝍸 𝍸 𝍸 𝍸 𝍸	
$90 < w \leqslant 100$	𝍸 𝍸	
		Total = 210

2 (d) Which **two** of these diagrams could you use to represent this grouped data?
Circle your answers.

[1 mark]

stem-and-leaf frequency polygon scatter graph histogram

7

3 The numbers of potatoes in fifteen sacks are shown.

42	31	33	46	37
35	29	51	37	44
38	50	49	28	36

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

[4 marks]

Key ..... | ..... represents ..... potatoes

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3 (b) Two of the sacks are chosen.
The first sack has 17 **more** potatoes than the second sack.

What is the greatest possible number of potatoes in the **first** sack?

[2 marks]

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Answer .....

4 (a) A **fair** coin is thrown five times.
These are the results.

tails heads heads heads heads

The coin is thrown again.

Write down the probability that it will land on tails this time.

[1 mark]

Answer .....

4 (b) Jon has made a ten-sided spinner.

Describe **fully** how he can test whether it is fair or biased.

[2 marks]

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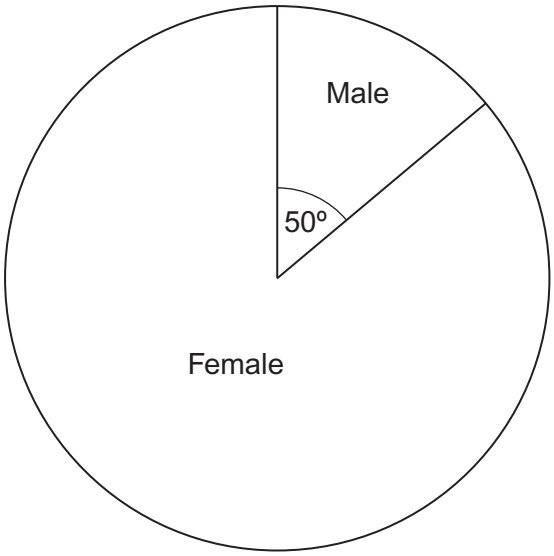
9

5 The pie chart shows the proportion of male and female teachers in 15 074 schools.

Primary school teachers



The mean number of teachers per school is 13.7

Work out the total number of **female** teachers in these schools.
Give your answer to 2 significant figures.

[5 marks]

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Answer .....

***6 (a)** The table shows the masses of planets in the form $a \times 10^{24}$ kg

Planet	Mass (kg)
Mercury	0.330×10^{24}
Venus	4.87×10^{24}
Mars	0.642×10^{24}
Jupiter	1900×10^{24}
Saturn	568×10^{24}

Write the mass of Jupiter in kilograms.
Give your answer in standard form.

[1 mark]

.....

Answer ..... kg

6 (b) The mass of the Earth is 5.97×10^{24} kg

The volume of the Earth is 1.08×10^{21} m^3

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Calculate the density of the Earth.
Give your answer to an appropriate degree of accuracy.

[3 marks]

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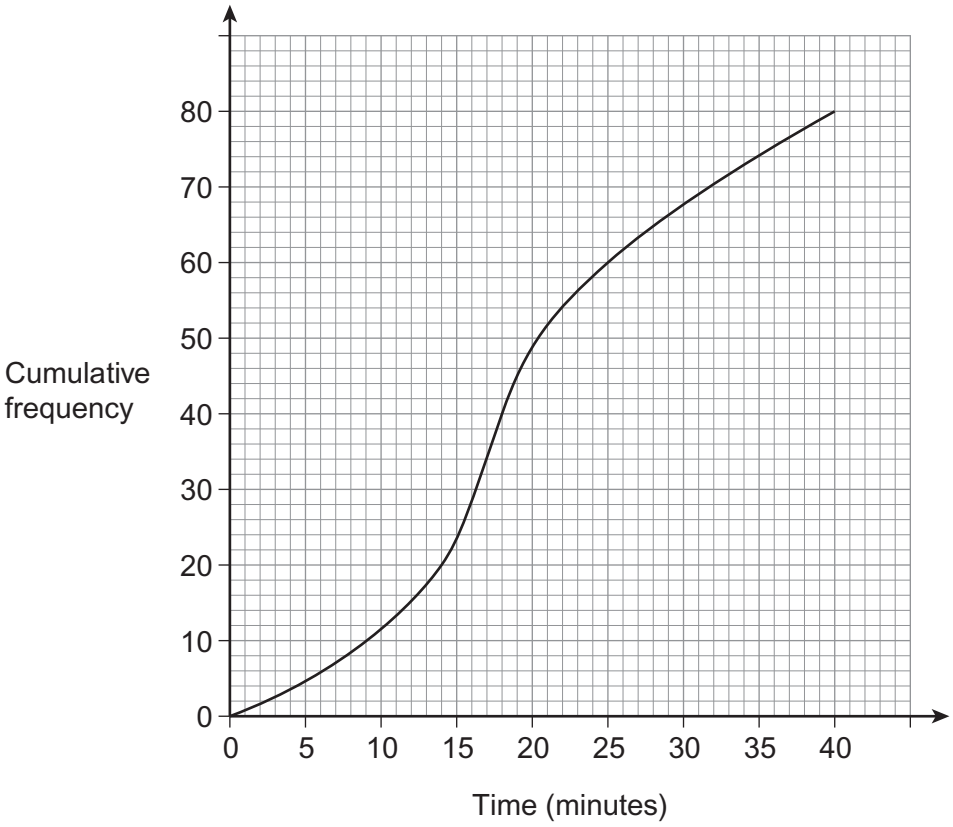
Answer ..... kg / m^3

9

7 80 women were timed solving a puzzle.

Women



80 men were also timed solving the puzzle.

Men

Median	16 minutes
Interquartile range	17 minutes

7 (a) Jack says,

"The data shows that the men were faster on average."

Is he correct?
You **must** show your working, which may be on the diagram.

[1 mark]

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7 (b) Ellie says,

"The data shows that the women were more consistent."

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

[2 marks]

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8 I increase a number by 24%
The answer is 6014.

What number did I start with?

[3 marks]

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Answer .....

6

9 Samples are taken from a production line.
500 items are checked in each sample.

The relative frequencies of the number of faulty items in 5 samples are shown.

Sample	A	B	C	D	E
Relative frequency	0.032	0.04	0.026	0.016	0.028

Work out the range of the number of faulty items in the 5 samples.

[3 marks]

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Answer .....

10 (a) Garage A sold 4960 vehicles.

The garage takes a sample of customers, stratified by type of vehicle sold.
Some information about the sample is shown.

	Car	People carrier	Van	Total
Number sold	2520			4960
Number in sample	126	44		

Complete the table.

[3 marks]

10 (b) Garage B sold 3790 vehicles, to 3 significant figures.

Write down the minimum and maximum possible number sold by Garage B.

[2 marks]

Minimum .....

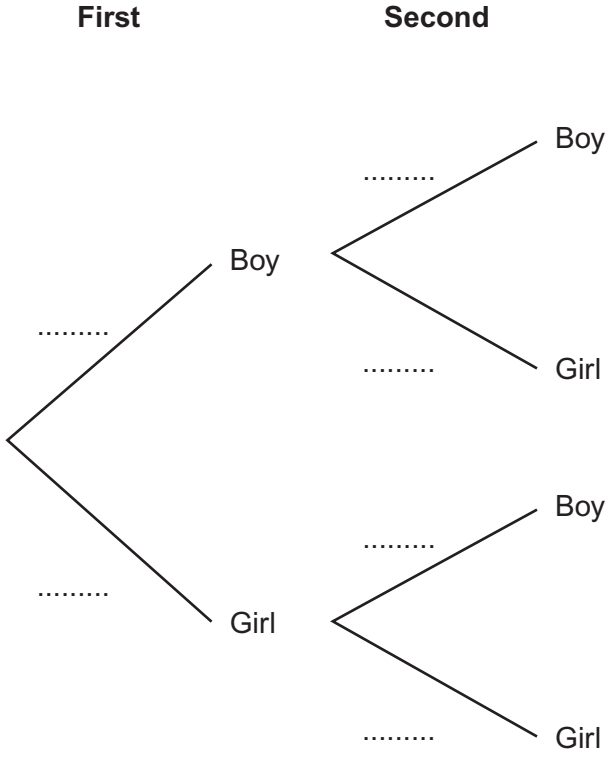
Maximum .....

8

11 A team has 7 boys and 3 girls.
Stevie chooses two of the team at random.

11 (a) Complete the probability tree diagram.

[3 marks]



11 (b) Work out the probability that he chooses one boy and one girl.

[3 marks]

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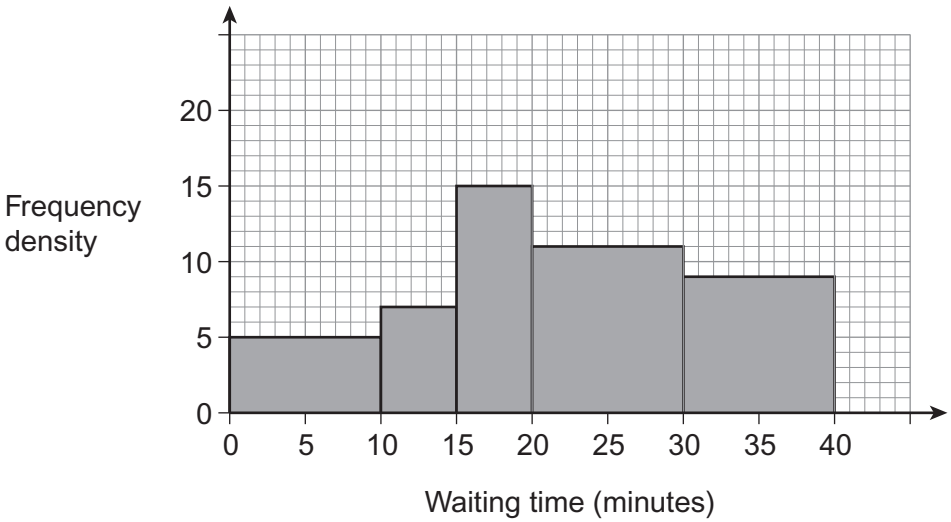
Answer .....

***12** Hamza made this hypothesis,

"60% of hospital patients wait between 20 and 40 minutes."

He collects data about the waiting times of 360 patients.

Hospital waiting times



Does the data support his hypothesis?
You **must** show your working.

[5 marks]

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END OF QUESTIONS

11

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ANSWER IN THE SPACES PROVIDED