Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2 – 3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
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TOTAL	

AQA

General Certificate of Secondary Education
Higher Tier
June 2015

Applications of Mathematics (Linked Pair) 93701H

H

Unit 1 Finance and Statistics

Thursday 4 June 2015 9.00 am to 10.30 am

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

Time allowed
- 1 hour 30 minutes

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. Cross through any work that you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

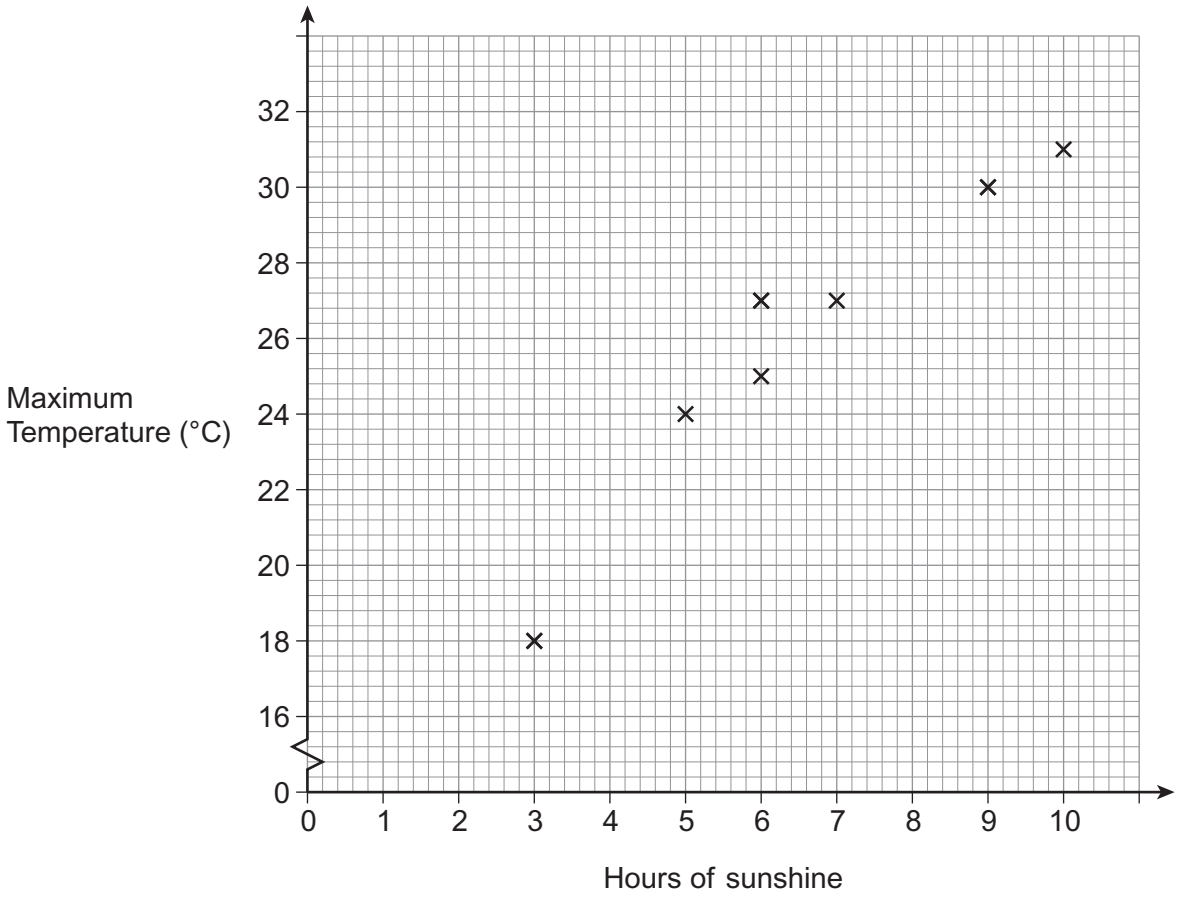
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80
- The quality of your written communication is specifically assessed in Questions 5, 6 and 8
  These questions are indicated with an asterisk (*).
- You may ask for more answer paper, tracing paper and graph paper. These must be tagged securely to this answer book.
- You are expected to use a calculator where appropriate.

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

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

1 The number of hours of sunshine and the maximum temperature in London were measured on seven days in July.

The information is shown in the scatter diagram.



1 (a) Use a line of best fit to estimate the maximum temperature on a day in July when there are 8 hours of sunshine.

[2 marks]

Answer ..... °C

1 (b) Explain why these data may **not** be representative of July temperatures in London.

[1 mark]

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1 (c) Can this graph be used to predict the maximum temperature for a day in **December** when there are 4 hours of sunshine?

Tick a box ☐ Yes ☐ No

Give a reason for your answer.

[1 mark]

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Turn over for the next question

4

2 (a) Jane uses $\frac{2}{3}$ of a metre of ribbon as trim for one dress.

How many metres of ribbon would she need for four dresses?
Circle your answer.

[1 mark]

$\frac{8}{12}$ 2.4 $2\frac{2}{3}$ $4\frac{2}{3}$ 6

2 (b) A small bottle holds $\frac{2}{5}$ of a litre of vinegar.

Small bottles are filled from containers that hold 5 litres of vinegar.

How many small bottles can be **completely** filled from three containers?

[2 marks]

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Answer .....

3 A restaurant manager is planning a survey.
He wants to find out how often his customers come to the restaurant.

Here is one of his questions with its response section.

Question How often do you come to this restaurant?

Response (Tick a box)

☐ Never ☐ Rarely ☐ Very often ☐ All the time

3 (a) Give **two** criticisms of this question and response section.

[2 marks]

Criticism 1 .....

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Criticism 2.....

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3 (b) Write a more suitable question the manager could ask.
Include a response section.

[2 marks]

7

Turn over ▶

4 Chump dog food costs £1.60 per kilogram.
Pally dog food costs £1.20 per kilogram.

15 kg of Chump is mixed with 25 kg of Pally.

Work out the cost of 1 kg of the mixture.

[4 marks]

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Answer £ .....

***5** Andrew, Nigel and Sam are picking oranges.

Andrew picks x oranges.

Nigel picks $2x$ oranges.

Sam picks 12 oranges more than Andrew.

Altogether they pick 84 oranges.

Set up and solve an equation to find the number of oranges Sam picks.

[5 marks]

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Answer .....

Turn over for the next question

9

6 The manager of a company records the time taken for every phone call made.
The table shows the results for 20 phone calls made one day.

Time taken for phone call, t (minutes)	Frequency		
$0 \leqslant t < 5$	2		
$5 \leqslant t < 10$	6		
$10 \leqslant t < 15$	8		
$15 \leqslant t < 20$	3		
$20 \leqslant t < 25$	1		

6 (a) Calculate an estimate of the mean time taken for a phone call.

[4 marks]

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Answer ..... minutes

6 (b) Give a reason why your answer to part (a) is an estimate.

[1 mark]

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***6 (c)** On the first Friday in September the company was charged for 250 minutes of phone calls.
Phone calls cost 9p per minute.

The total cost of all the telephone calls made in September is £452.25

The company works for 21 days in September.

Compare the number of minutes of calls made on the first Friday in September with the daily average for the 21 days worked in September.

[4 marks]

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Turn over for the next question

9

7 The price of a fridge is usually £230

In a sale the price is reduced by 25%

On the last day the **sale price** is reduced by 10%

Work out the price of the fridge on the last day of the sale.

[3 marks]

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Answer £ .....

***8** Jade wants to investigate the hypothesis

'Teenage girls spend more time on social media sites than teenage boys'.

Describe how she could do this.

Your plan should include

- collecting data
- processing and representing the data
- interpreting and discussing the results.

[5 marks]

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9 Ahmed, Ben and Carla share some money.

Ahmed gets $\frac{3}{7}$ of the money.

Ben and Carla share the rest of the money in the ratio 3 : 2

Carla gets £64

Work out how much Ahmed gets.

[5 marks]

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Answer £ .....

10 (a) A caravan has a mass of 1300 kg correct to the nearest 10 kg

What is the **minimum** mass the caravan could be?
Circle your answer.

[1 mark]

1250 kg 1290 kg 1294 kg 1295 kg 1296 kg

10 (b) A running circuit is 250 metres long, correct to the nearest metre.
Kate runs round the circuit seven times.

What is the **upper limit** of the distance she could have run?

[2 marks]

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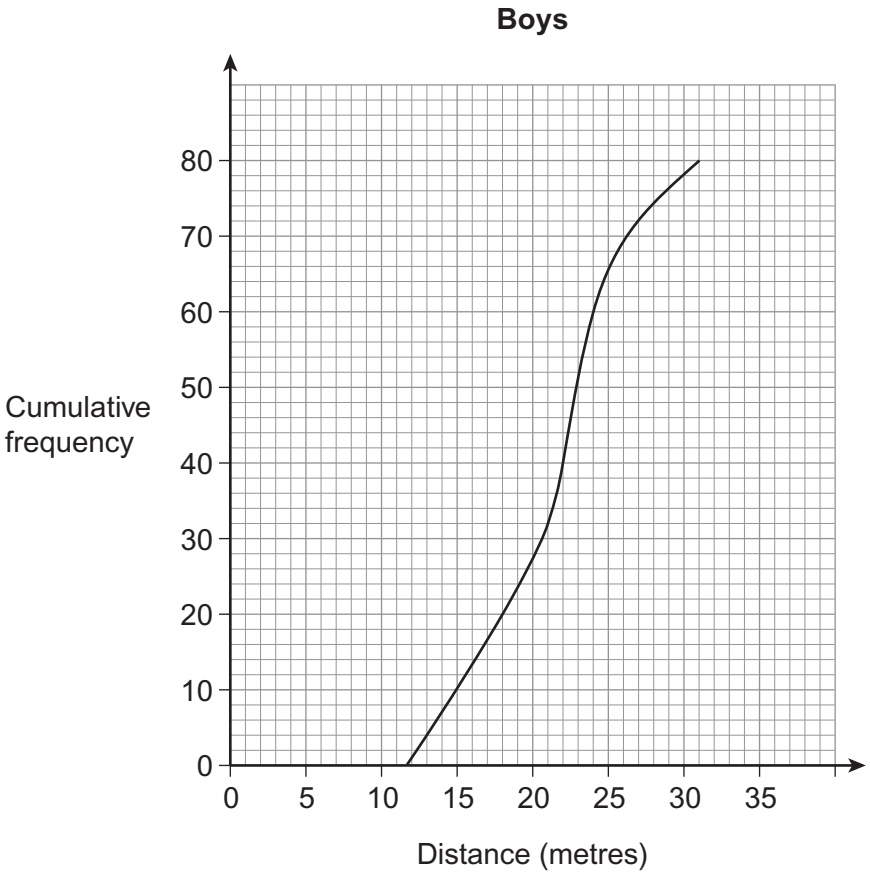
Answer ..... m

Turn over for the next question

8

11 The cumulative frequency graph shows the javelin distances thrown by 80 boys.



11 (a) Write down the median distance thrown.

[1 mark]

Answer ..... metres

11 (b) Work out the interquartile range of the distances thrown.

[2 marks]

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Answer ..... metres

11 (c) The box-and-whisker plot shows information about the javelin distances thrown by 80 girls.

Girls

On average, did the boys or the girls throw further?
Give a reason for your answer.

[1 mark]

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11 (d) The boys' and girls' results are combined.

Work out an estimate of the proportion of all throws that are greater than 21 metres.

[4 marks]

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Answer .....

8

12 3 packs of biscuits and 2 packs of teabags cost £4.84
5 packs of biscuits and 3 packs of teabags cost £7.65

Ella has £15
She needs to buy packs of biscuits and packs of teabags in the ratio 3 : 1

Work out the largest number of packs of biscuits and packs of teabags she can buy.
You **must** show your working.
Do **not** use trial and improvement.

[7 marks]

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Answer ..... packs of biscuits

..... packs of teabags

13 In a hotel, the bedrooms are all the same size.
4 painters are needed to paint 10 bedrooms in 5 days.

How many painters are needed to paint 12 bedrooms in 3 days?

[4 marks]

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Answer .....

Turn over for the next question

11

14 A gym club has 1200 members.
The table shows information about the employment status of each club member.

	Work full-time	Work part-time	Student	Not working
Men	365	105	83	162
Women	215	142	75	53

A sample of 100 of the club members is chosen, stratified by employment status and gender.

14 (a) Calculate the number of women in the sample who work full-time.

[2 marks]

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Answer .....

14 (b) Calculate the total number in the sample who are men **or** members not working.

[2 marks]

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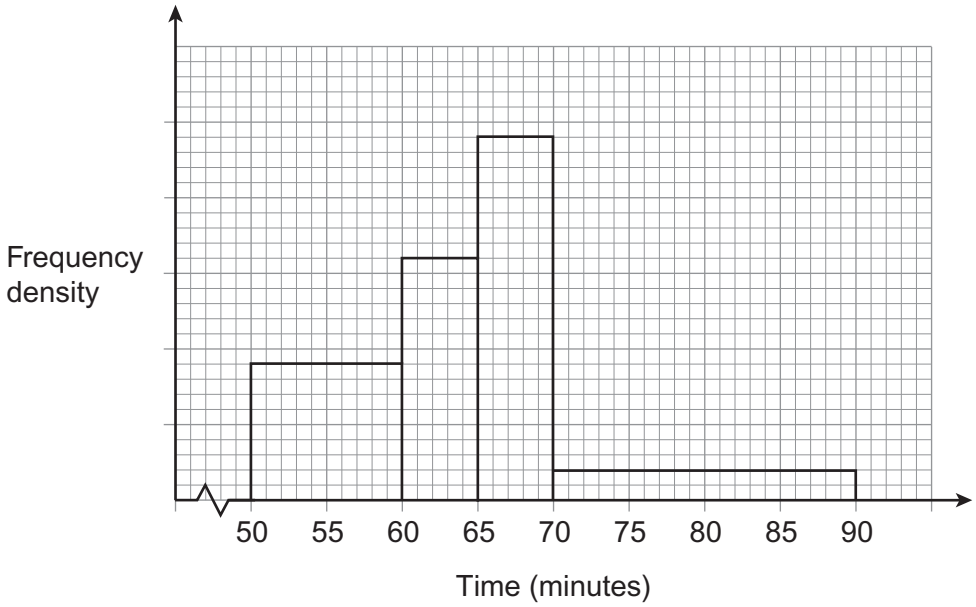
Answer .....

15 66 runners took part in a cross-country race.
The histogram represents their times in minutes.



Runners completing the race in under 62 minutes qualified for the next race.

Estimate the number of runners qualifying for the next race.

[5 marks]

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Answer .....

9

16 Robbie has two part-time jobs.

He mows lawns for at least 4 hours each week.

He delivers leaflets for at least 2 hours each week.

He is not allowed to work for more than 16 hours in total each week.

16 (a) Two inequalities for this information are

$$x \geqslant 4 \text{ and } y \geqslant 2$$

Explain what the letter symbols x and y represent.

[1 mark]

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16 (b) Use the information to write down an inequality in x and y.

[1 mark]

Answer .....

16 (c) The line $x = 4$ is drawn on the graph opposite.

Complete the graph to show **all** of the information.

[3 marks]

16 (d) Robbie earns £6 per hour mowing lawns and £4.50 per hour delivering leaflets.

Can he earn over £100 in a week?
Explain your answer.

[2 marks]

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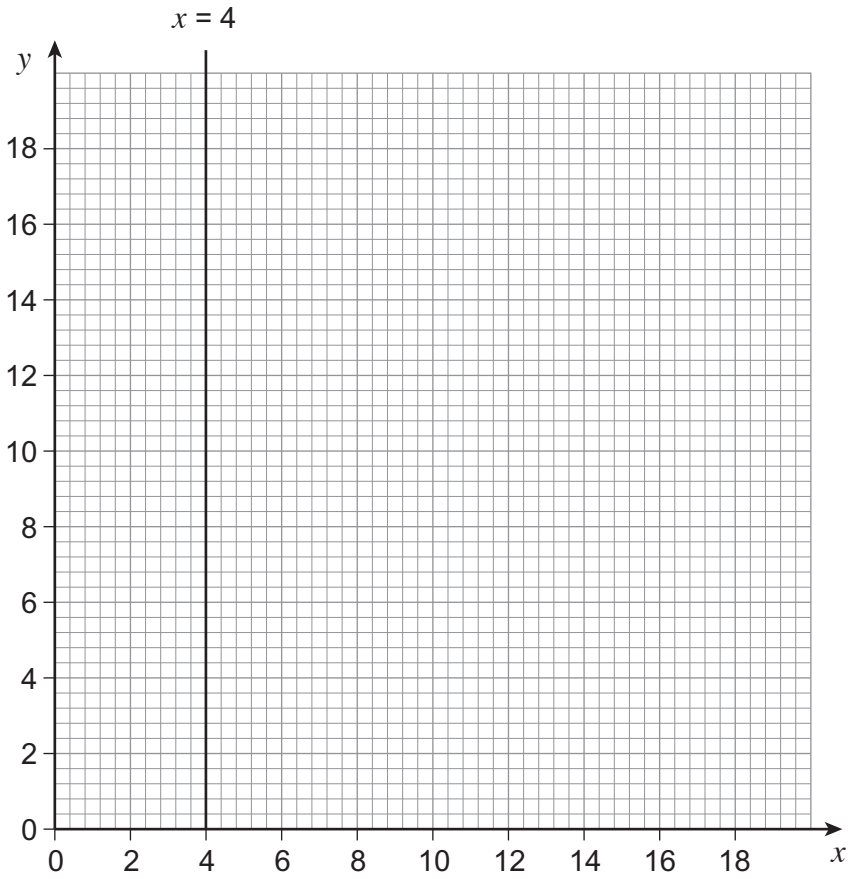

END OF QUESTIONS

7

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