

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	
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10–11	
12–13	
14–15	
TOTAL	



General Certificate of Secondary Education
Higher Tier
June 2012

Applications of Mathematics 93701H (Linked Pair Pilot)

Unit 1 Finance and Statistics

H

Tuesday 19 June 2012 1.30 pm to 3.00 pm

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 space 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 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 6, 8 and 11.
These questions are indicated with an asterisk (*)
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

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



J U N 1 2 9 3 7 0 1 H 0 1

WMP/Jun12/93701H

93701H

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

1 (a) A survey asks 300 people how they travel on long journeys.

- 12 women travel by plane
- one-third of the people travel by train
- 28 people travel by coach
- twice as many men as women travel by car

Use this information to complete the two-way table.

	Car	Train	Coach	Plane
Men			7	19
Women		51		

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(4 marks)

1 (b) A company wants to know if train passengers bought their tickets

- on the train
- at the station
- using the internet

Design a data collection sheet.
Make up the first ten entries.

(2 marks)



2 (a) Sophie has 50 bulbs.
The bulbs cost a total of £15.
96% of the bulbs grow into plants.

Sophie sells $\frac{3}{4}$ of the plants at £3.99 each.

She sells the rest at £2.50 each.

How much profit does Sophie make?

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Answer £ (6 marks)

2 (b) Sophie also has 120 apples.
She sells 78 of them.

Work out the percentage of apples she sells.

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Answer % (2 marks)



3 Christmas cards are sold in boxes.

- A box of 6 cards costs £2.80
- A box of 8 cards costs £3.50
- A box of 10 cards costs £4.45

What is the cheapest way to buy **exactly** 30 cards?
You **must** show your working.

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Cheapest way

Cheapest cost £

(3 marks)

4 Some men, women and children watch a school football match.

- There are less than 100 men.
- The number of women is exactly one-eighth of the number of men.
- The number of children is exactly 10% of the number of men.

What is the **least** number of men there could be?
You **must** show your working.

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Answer

(3 marks)



5 The number of minutes 50 people ski one morning is recorded.

Time, t (minutes)	Number of people	Midpoint	
$0 < t \leq 30$	7		
$30 < t \leq 60$	17		
$60 < t \leq 90$	22		
$90 < t \leq 120$	4		

5 (a) (i) Use midpoints to calculate an estimate of the mean number of minutes these people ski for.

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Answerminutes (3 marks)

5 (a) (ii) One of these people is chosen at random.

James says

“The probability that this person skis for longer than 1 hour is 0.5”

Is James correct?

You **must** show your working.

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(2 marks)

5 (b) The cost to ski on a dry ski slope is £5 per session.
 The cost to hire equipment is £4 per session.
 80% of people who ski hire equipment.

It costs £123 per session to open the slope.

What is the smallest number of people needed to cover the cost of opening the slope?
 You **must** show your working.

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Answer (4 marks)

15

Turn over ►



*6 Three sisters do a sponsored swim.

6 (a) Altogether they swim a total of 575 metres divided in the ratio of their ages.

Chloe is 10 years old.
Danni is 8 years old.
Ella is 5 years old.

Work out the distance Ella swims.

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Answer m (3 marks)

6 (b) The three sisters collect their sponsor money.

Chloe collects £5 more than Ella.
Danni collects twice as much as Chloe.

The total collected is £65.

Set up and solve an equation to work out the amount Ella collects.

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Answer £ (5 marks)



7 Mrs Keen knits a scarf and a jumper.

The scarf uses exactly 3 large balls of wool and 1 small ball of wool.
The scarf weighs 175 grams.

The jumper uses exactly 5 large balls of wool and 2 small balls of wool.
The jumper weighs 300 grams.

Work out the number of grams of wool in each size of ball.
You **must** show your working.

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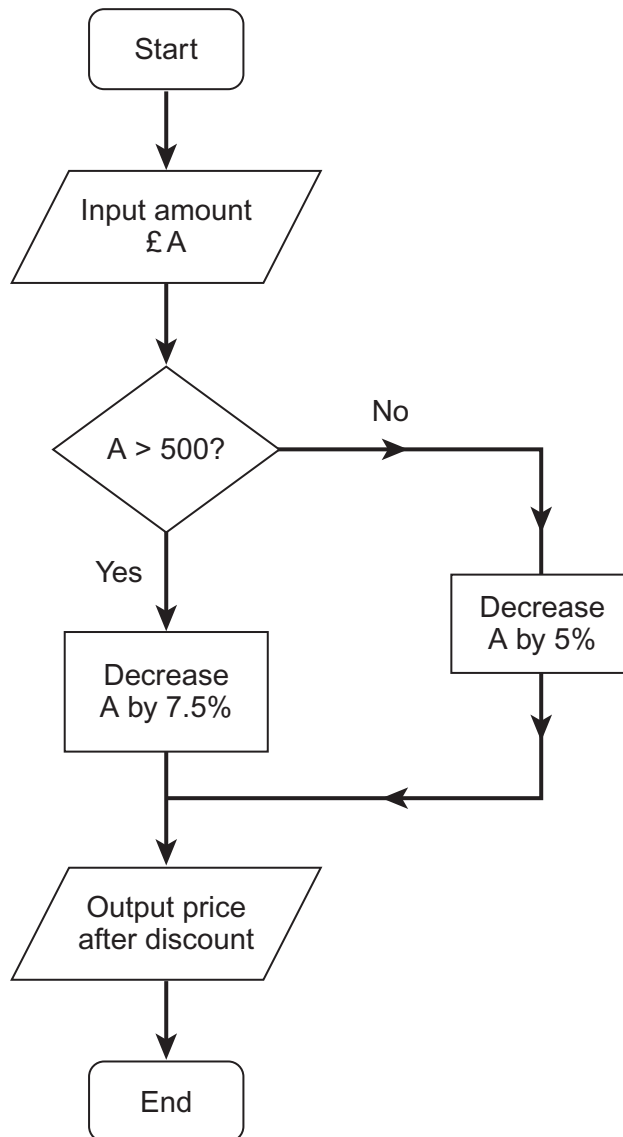
Answer Large ball grams

Small ball grams (4 marks)

Turn over for the next question



8 (a) A shop manager uses this flow diagram to work out prices after discounts.



Anna spends £495.
Karen spends £10 more than Anna.

How much more discount does Karen get than Anna?
Give your answer to the nearest penny.

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Answer £ (5 marks)



9 A company's one-year guarantee pays for repair or replacement of a washing machine. To work out the charge for the guarantee, the company makes these estimates.

Probability of a repair 0.084
Average cost of repair £65

Probability of replacement 0.036
Average cost of replacement £325.

What is the minimum amount the company should charge for the guarantee?

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Answer £ (4 marks)



10 (a) On average, 3 bricks out of every pack of 500 bricks are faulty.
A building firm buys 10 000 bricks.

How many bricks do they expect to be faulty?

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Answer (2 marks)

10 (b) The building firm has to build 37 brick walls in 20 days.
All the walls are the same size.

The firm uses 3 bricklayers.
They build 18 walls in 15 days.

After 15 days, the firm uses extra bricklayers to build the walls on time.

Work out the smallest number of **extra** bricklayers they use.
You **must** show your working.

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Answer (5 marks)

Turn over for the next question



11 (a) 1750 people take their driving test in Durham one month. The table shows the distribution of their ages.

17-25 years	26-35 years	Over 35 years
1045	510	195

A sample of 100 of these people, stratified by age, are chosen for a survey.

Work out the number of people chosen from each age group.

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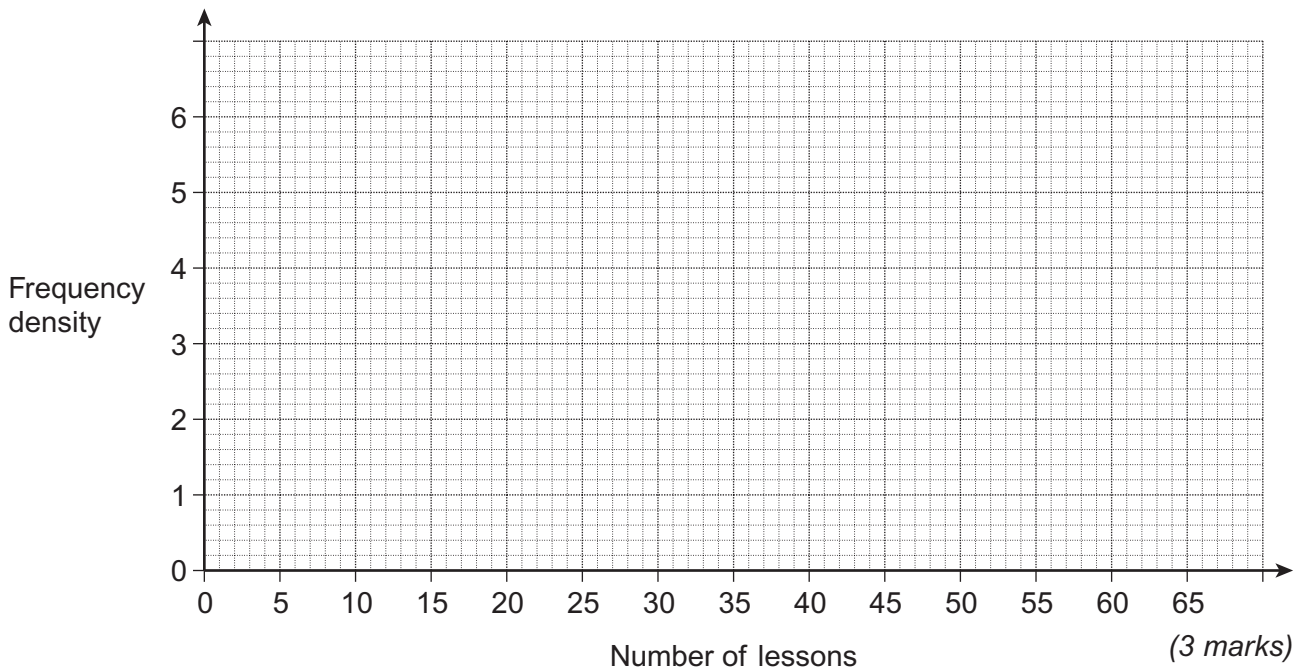
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Answer 17-25 years 26-35 years Over 35 years (3 marks)

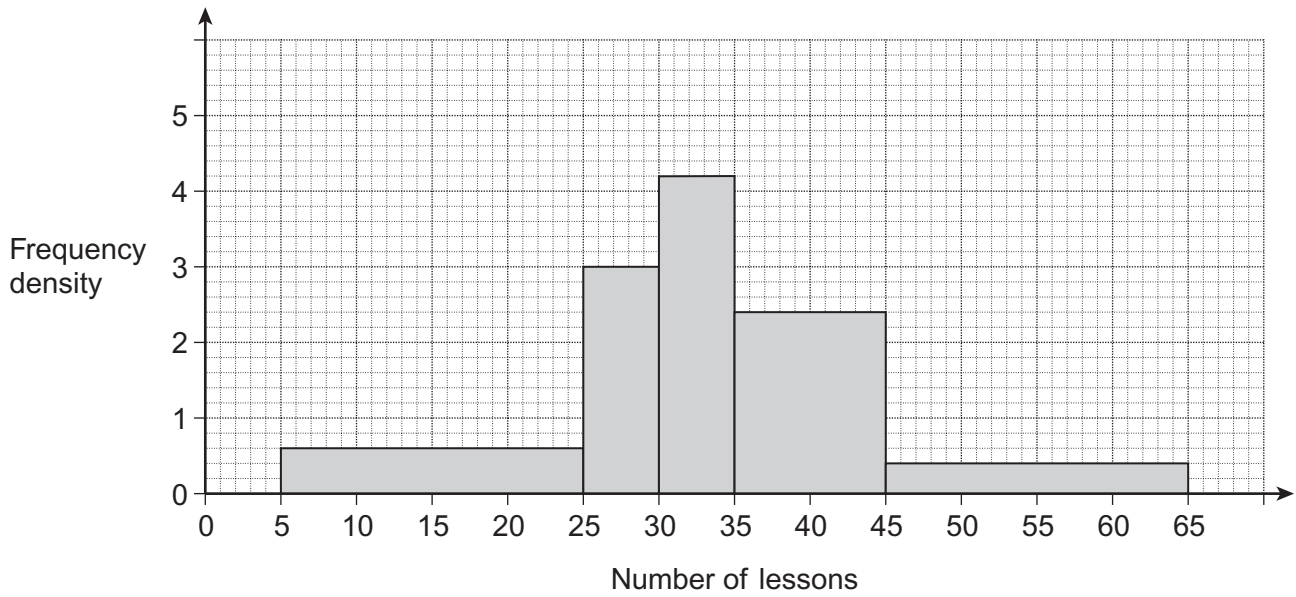
11 (b) The table shows information about the number of driving lessons taken by 100 people at Test Centre A.

Number of lessons (l)	Frequency
$5 \leq l < 25$	24
$25 \leq l < 30$	22
$30 \leq l < 35$	28
$35 \leq l < 45$	20
$45 \leq l < 65$	6

Draw a histogram to represent this information.



***11(c)** This histogram represents the number of driving lessons taken by 80 people at Test Centre B.



Compare the proportion of people, at the two test centres, who took more than 40 lessons.

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(5 marks)

Turn over for the next question



12 A company builds stools and chairs.
The table shows the times needed on the cutting machine and on the assembly line.

	Time on cutting machine	Time on assembly line
Stool	40 minutes	30 minutes
Chair	20 minutes	70 minutes

The cutting machine is available for 5 hours each day.
The assembly line is available for 7 hours each day.

Let the number of stools built be x .
Let the number of chairs built be y .

12 (a) Use the information about the assembly line to show that

$$3x + 7y \leq 42$$

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(1 mark)

12 (b) Use the information about the cutting machine to write down another inequality in x and y .

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Answer (2 marks)

12 (c) The profit on a stool is £18.
The profit on a chair is £27.

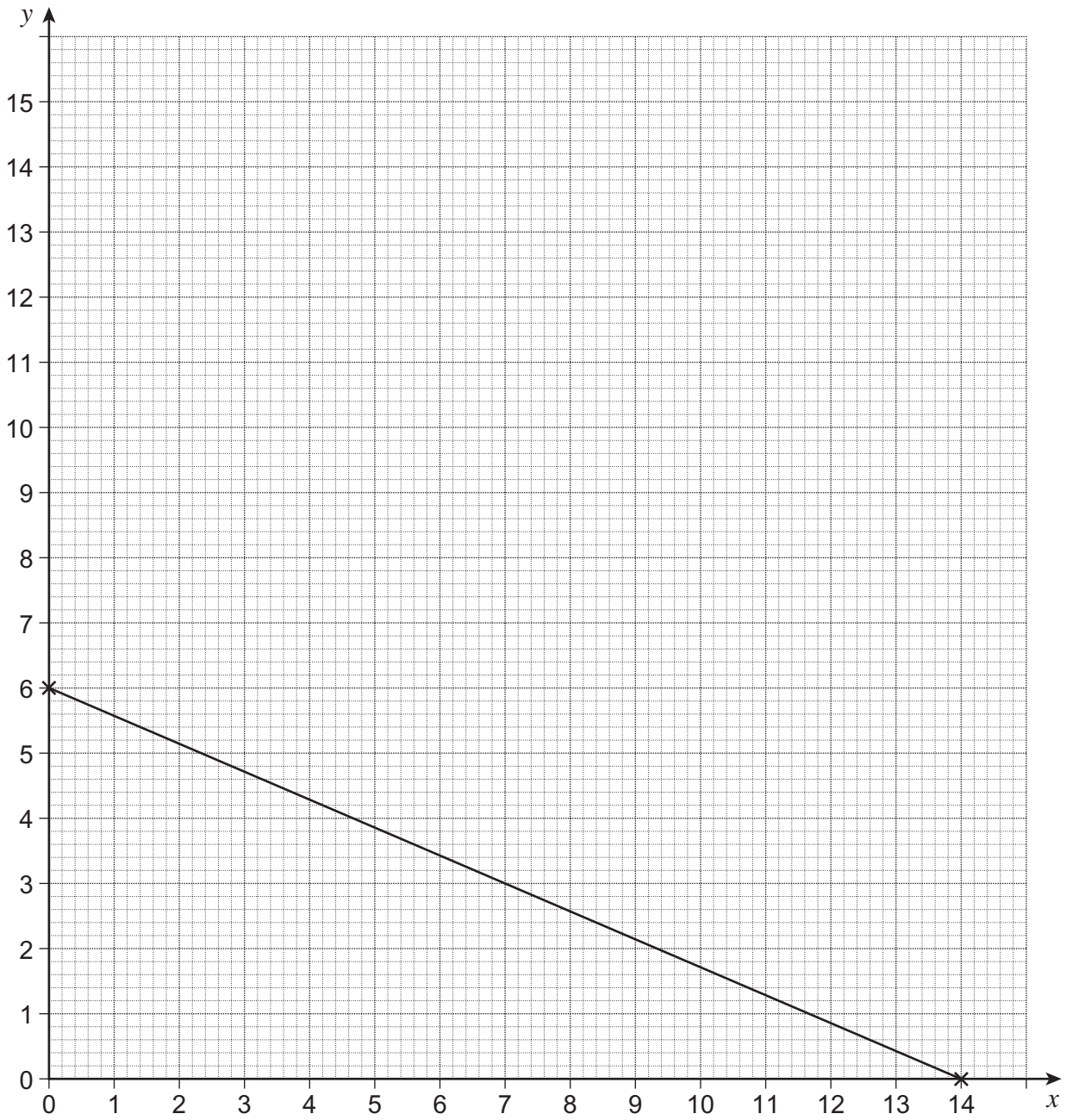
Work out the number of stools and chairs that should be built per day so that the company makes the maximum profit.

The line $3x + 7y = 42$ has been drawn on the grid opposite to help you.

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Answer stools chairs





(4 marks)

END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

