

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

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General Certificate of Secondary Education
March 2005



MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HA
Module 1 Higher Tier Section A

Monday 28 February 2005 1.30 pm to 1.55 pm

H

<p>In addition to this paper you will require:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments • a treasury tag. 	
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For Examiner's Use			
Section A		Section B	
Number	Mark	Number	Mark
1		5	
2		6	
3		7	
4		8	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

Time allowed for Section A: 25 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- This paper is divided into **two** sections: Section A and Section B.
- After the 25 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

Information

- The maximum mark for Section A is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and 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.

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

1 The number of minutes that trains arrived late at a station is shown in the table below.

Number of minutes late, t	Frequency	Midpoint
$0 < t \leq 10$	16	
$10 < t \leq 20$	10	
$20 < t \leq 30$	11	
$30 < t \leq 40$	8	
$40 < t \leq 50$	5	

(a) Complete the midpoint column and use it to calculate an estimate of the mean number of minutes that trains arrived late.

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Answer minutes (3 marks)

(b) Which class interval contains the median number of minutes that trains arrived late?

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Answer $< t \leq$ minutes (2 marks)



- 2 A coach company recorded the number of bookings it took each quarter over a two-year period.
The figure for the first quarter of 2004 has been missed out.

	2003				2004			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Number of bookings	24	52	83	37		61	86	40

- (a) Explain why a four-point moving average is appropriate for this data.

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(1 mark)

- (b) Show that the first value of the four-point moving averages is 49.

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(1 mark)

- (c) The second value of the four-point moving averages is 51.

Calculate the number of bookings taken in the first quarter of 2004.

.....

Answer (3 marks)



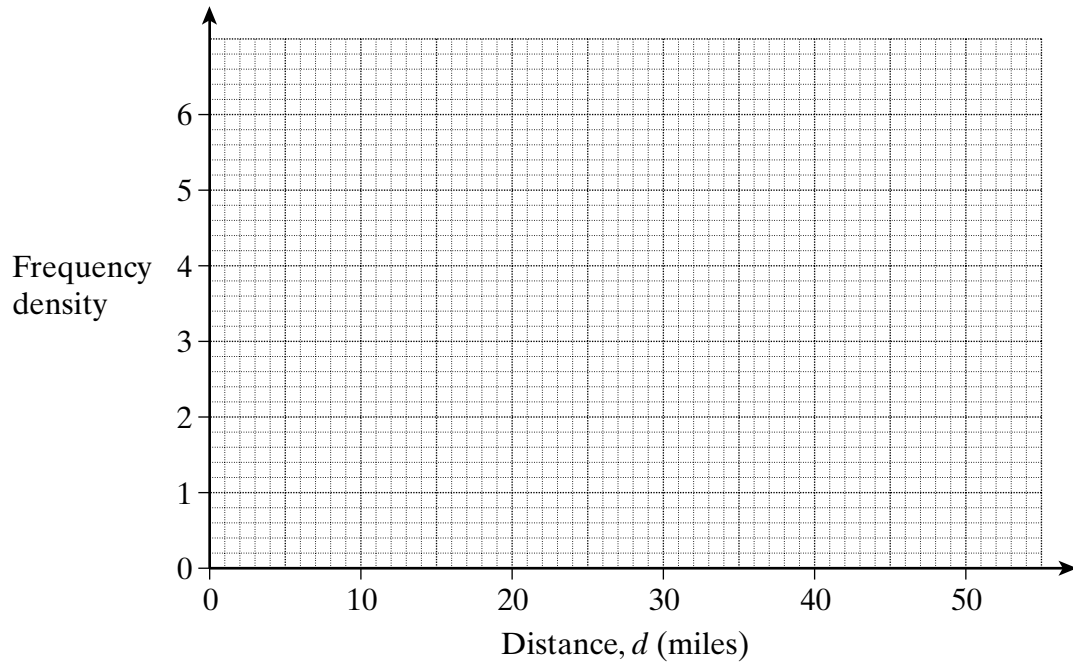
Turn over ►

- 3 In a survey 120 people were asked how far they travel to work each day.

The table shows the results.

Distance, d (miles)	Frequency
$0 < d \leq 5$	17
$5 < d \leq 10$	29
$10 < d \leq 20$	36
$20 < d \leq 30$	24
$30 < d \leq 50$	14

- (a) Draw a histogram to represent this information.



(3 marks)

- (b) Estimate how many people travel more than 22 miles to work.

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Answer (2 marks)

- 4 The membership of a gymnastics club is shown in the two-way table.

	Seniors	Juniors
Girls	10	22
Boys	4	12

The club is given two tickets to watch a competition.
The club chooses two members, at random, to receive these tickets.

Calculate the probability that

- (a) two junior girls are chosen,

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Answer (2 marks)

- (b) the two members chosen are of the same sex.

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Answer (3 marks)

END OF SECTION A

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General Certificate of Secondary Education
March 2005



**MATHEMATICS (MODULAR) (SPECIFICATION B)
Module 1 Higher Tier Section B**

33001/HB

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Monday 28 February 2005 2.00 pm to 2.25 pm

<p>In addition to this paper you will require: mathematical instruments.</p> <p>You must not use a calculator.</p>	
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Time allowed for Section B: 25 minutes

Instructions

- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- You may **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

Information

- The maximum mark for Section B is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.

Advice

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

NO QUESTIONS APPEAR ON THIS PAGE

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

5 In a sixth form college there are 1000 students.

$\frac{2}{5}$ of the students are girls.

The probability that a girl chosen at random studies mathematics is $\frac{1}{10}$

The probability that a boy chosen at random studies mathematics is $\frac{1}{6}$

Calculate how many students in the college study mathematics.

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Answer students (4 marks)



TURN OVER FOR THE NEXT QUESTION

Turn over

- 6 A gardener grows two batches of sunflower plants, batch A and batch B. The diagram on the page opposite shows the cumulative frequency of the heights of the plants in batch A.

- (a) Estimate the number of plants in batch A that are under 100 cm tall.

Answer plants (1 mark)

- (b) The plants in batch B are fed with a special fertiliser. The heights of these plants are shown in the cumulative frequency table.

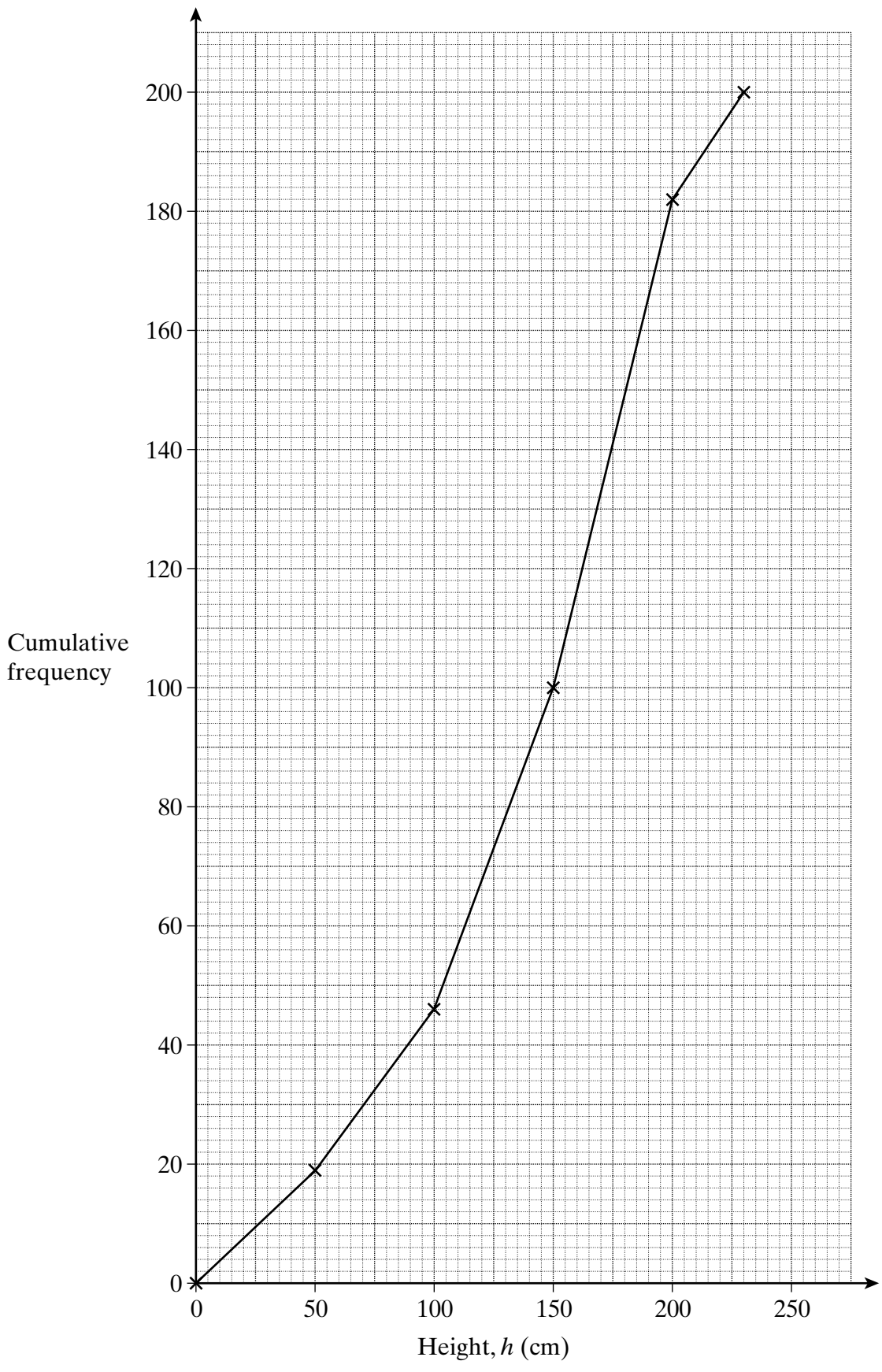
Height, h (cm)	Cumulative frequency
$h \leq 50$	3
$h \leq 100$	17
$h \leq 150$	68
$h \leq 200$	146
$h \leq 250$	200

On the same axes draw a cumulative frequency diagram to represent batch B. (3 marks)

- (c) What is the difference between the median heights of plants in batch A and batch B?

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Answer cm (2 marks)



Turn over 

7 The owner of a health club wants to find out how often the members use the club. He first collects data about the age and gender of the 1000 members.

	Under 25	25 - 40	41 - 50	Over 50
Men	162	265	134	49
Women	178	110	70	32

(a) Give **one** reason why a stratified sample may be better than a random sample in this situation.

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(1 mark)

(b) The owner decides to take a stratified sample of size 50 by age and gender.

(i) Calculate how many men aged 25–40 he should choose.

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Answer (2 marks)

(ii) Calculate how many members of each gender he should choose.

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Answer Men

Women

(2 marks)



8 Katy and Admir take part in a quiz.

The probability that Katy answers a question correctly is $\frac{2}{3}$

The probability that Admir answers a question correctly is $\frac{3}{4}$

They are asked two questions each.

Calculate the probability that they answer three out of the four questions correctly.

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Answer (5 marks)



END OF QUESTIONS