Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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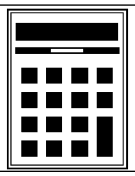
General Certificate of Secondary Education
March 2005

ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/IA
Module 1 Intermediate Tier Section A

Monday 28 February 2005 1.30 pm to 1.55 pm

In addition to this paper you will require:
- a calculator
- mathematical instruments
- a treasury tag.



For Examiner's Use			
Section A		Section B	
Number	Mark	Number	Mark
1		6	
2		7	
3		8	
4		9	
5			
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.

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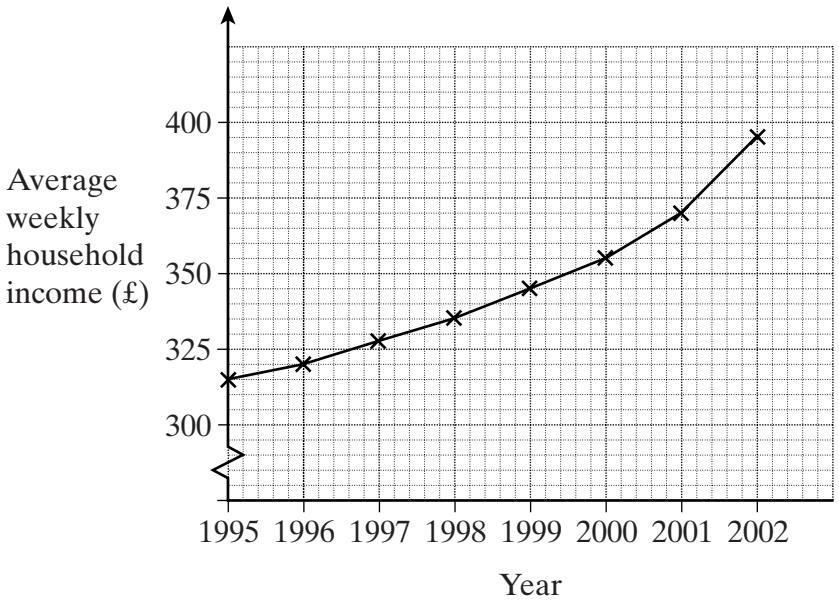
Answer **all** questions in the spaces provided.

1 The graph shows the average weekly household income in the UK.



(a) By how much did the average weekly household income increase from 2000 to 2001?

.....

Answer £ ..... *(1 mark)*

(b) Between which two years was there the largest annual increase in average weekly household income?

.....

.....

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

2

LEAVE MARGIN BLANK

2 A taxi-driver keeps a record of how much he spends on petrol each week.
The amounts, in pounds, are

30	24	32	15	28	9	18
24	23	36	22	14	19	41

(a) Draw an ordered stem-and-leaf diagram to show these amounts.
Remember to complete the key.

.....

.....

.....

.....

.....

Key ..... | ..... represents £ .....

0	.....
1	.....
2	.....
3	.....
4	.....

(3 marks)

(b) Work out the range of these amounts.

.....

Answer £ ..... *(1 mark)*

4

Turn over ▶

LEAVE MARGIN BLANK

3 (a) The probability of winning a game at a charity fete is 0.4

What is the probability of **not** winning the game?

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

(b) A different game at the fete involves throwing one dart at a target.

The probability of hitting the target is 0.2
The game costs 50p a go.
100 people play this game.
A prize of £1 is won for hitting the target.

Calculate the expected profit.

.....

.....

.....

.....

Answer £ ..... *(3 marks)*

4

LEAVE MARGIN BLANK

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

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

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

.....

.....

.....

.....

.....

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

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

.....

.....

Answer ..... $< t \leqslant$ ..... minutes *(2 marks)*

5

Turn over ▶

LEAVE MARGIN BLANK

5 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.

.....

.....

.....

(1 mark)

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

.....

.....

.....

(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)*

5

END OF SECTION A

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

General Certificate of Secondary Education
March 2005

ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/IB
Module 1 Intermediate Tier Section B

Monday 28 February 2005 2.00 pm to 2.25 pm

In addition to this paper you will require:
mathematical instruments.

You must **not** use a calculator.

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

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

6 Chris plays a game.
He has two sets of four cards.
The first set of cards is numbered 1 to 4.

1	2	3	4

The second set of cards is numbered 5 to 8.

5	6	7	8

Chris chooses a card from each set at random.
He adds together the numbers on the two chosen cards to get his score.

(a) Complete the table to show all the scores that Chris can make.

1st set of cards

2nd set of cards

	1	**2**	**3**	**4**
5				
6				
7				
8				

(2 marks)

(b) Calculate the probability that Chris scores

(i) 6

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

(ii) 10 or more.

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

(c) Chris plays the game 100 times.
How many times would you expect him to score 9?

.....

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

7

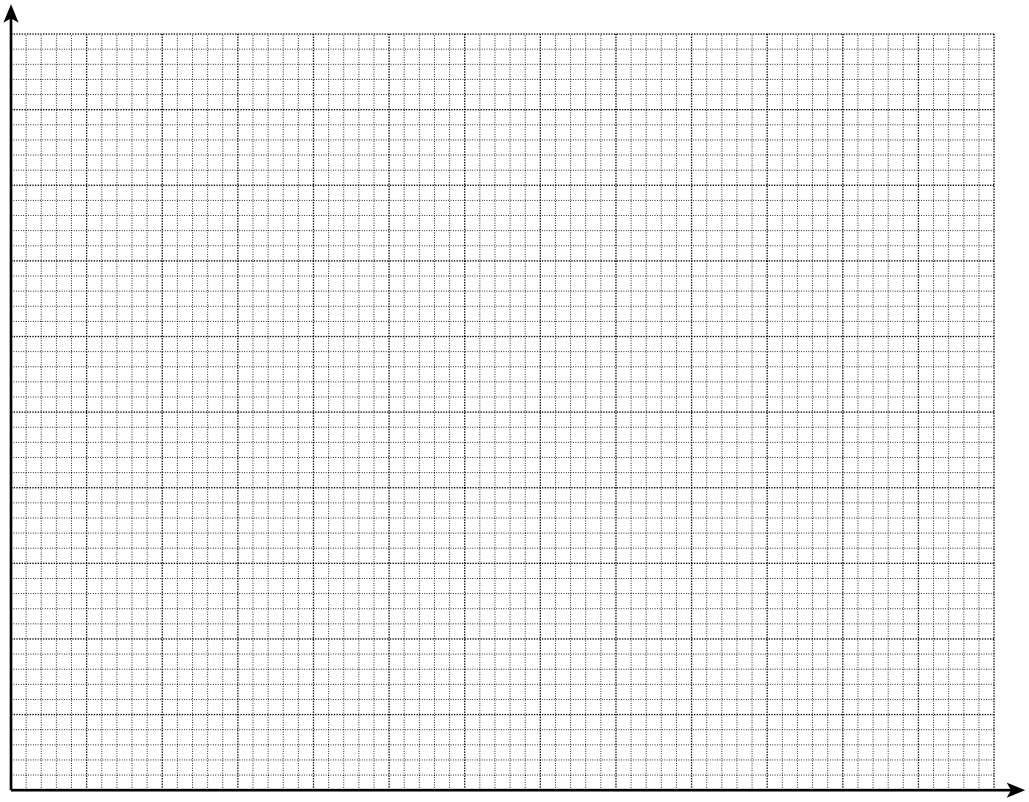
Turn over ▶

LEAVE MARGIN BLANK

7 The frequency table shows the costs of car insurance premiums paid by 200 people.

Insurance premium, £ x	**Frequency**
$200 < x \leqslant 400$	34
$400 < x \leqslant 600$	52
$600 < x \leqslant 800$	76
$800 < x \leqslant 1000$	26
$1000 < x \leqslant 1200$	12

Draw a frequency diagram to represent this data.



(3 marks)

3

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8 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.

.....

.....

.....

.....

.....

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

4

TURN OVER FOR THE NEXT QUESTION

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9 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**
$h \leqslant 50$	3
$h \leqslant 100$	17
$h \leqslant 150$	68
$h \leqslant 200$	146
$h \leqslant 250$	200

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

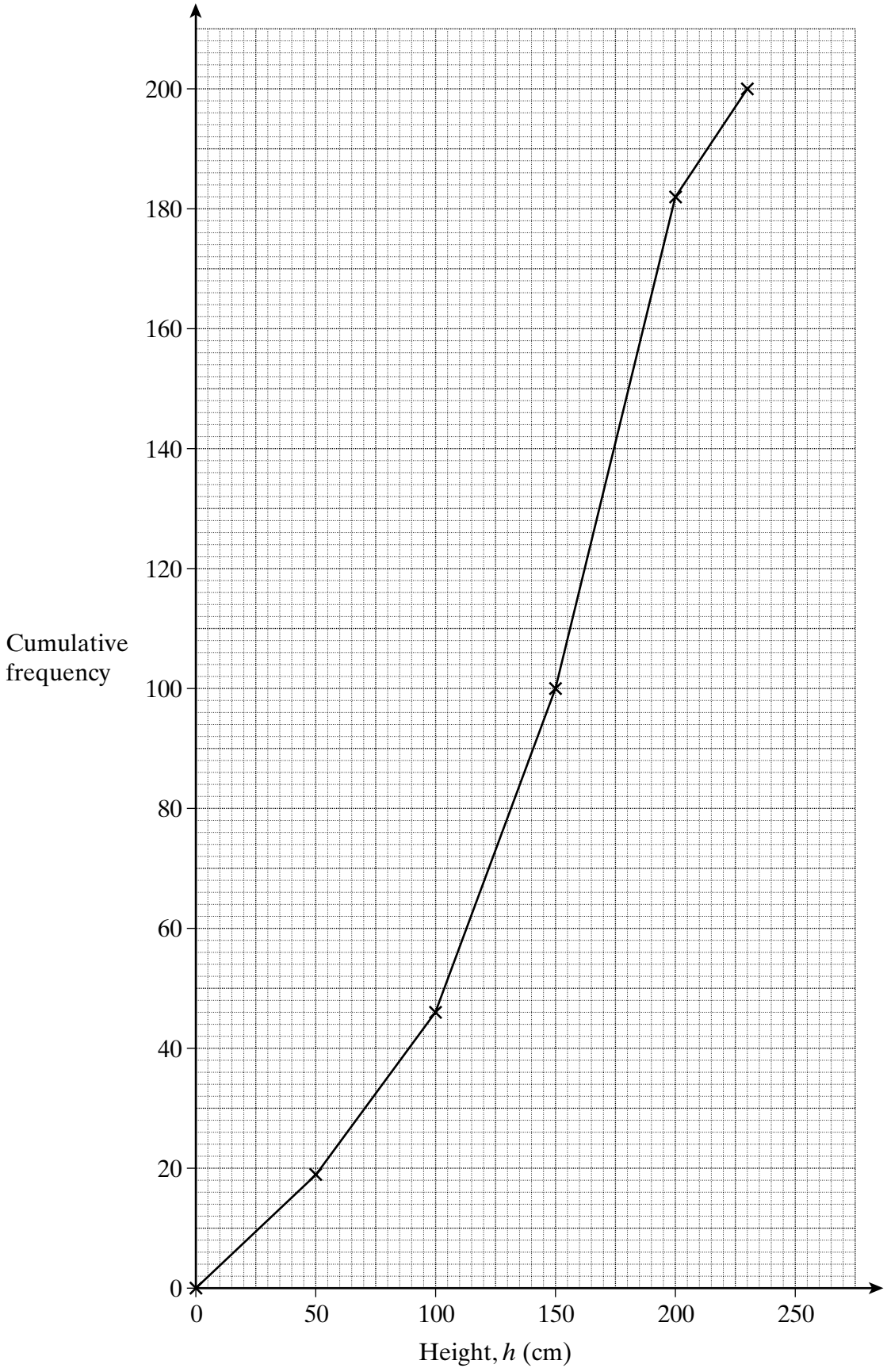
(c) What is the difference between the median heights of plants in batch A and batch B?

.....

.....

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

LEAVE MARGIN BLANK



6

END OF QUESTIONS

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