Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

For Examiner's Use

General Certificate of Secondary Education
March 2009

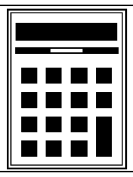
ASSESSMENT and QUALIFICATIONS ALLIANCE

MATHEMATICS (MODULAR) (SPECIFICATION B) 43051/HA
Module 1 Higher Tier Section A

H

Tuesday 3 March 2009 1.30 pm to 2.00 pm

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



Time allowed for Section A: 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. Answers written in margins will not be marked.
- Use a calculator where appropriate.
- Do all rough work in this book.
- This paper is divided into two sections: Section A and Section B.
- After the 30 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 23.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

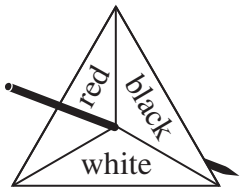
Advice
- In all calculations, show clearly how you work out your answer.

For Examiner's Use			
Section A		**Section B**	
Question	Mark	Question	Mark
1		6	
2		7	
3		8	
4		9	
5		10	
		11	
Total Section A			
Total Section B			
TOTAL			
Examiner's Initials			

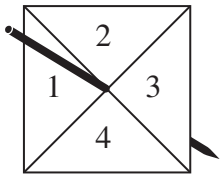
Answer **all** questions in the spaces provided.

1 Ann has two fair spinners.

Spinner 1



Spinner 2



Ann spins both spinners and records the colour and number.
She repeats this a number of times.

1 (a) Design a two-way table to show the possible results.

(3 marks)

1 (b) Here are Ann's first five results.

black, 2 red, 2 red, 4 white, 1 black, 2

Put tallies in your table to show Ann's first five results.

(1 mark)

4

2 There are 600 marbles in a bag.
The colours of the marbles are yellow, red, blue, black or white.
A marble is picked at random.
The probability that the marble is yellow is 0.2

2 (a) Work out the number of yellow marbles in the bag.

.....

.....

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

2 (b) The probability that the marble is white is 0.1
There are 57 black marbles in the bag.
There are twice as many blue marbles as red marbles.

Work out the number of red marbles in the bag.

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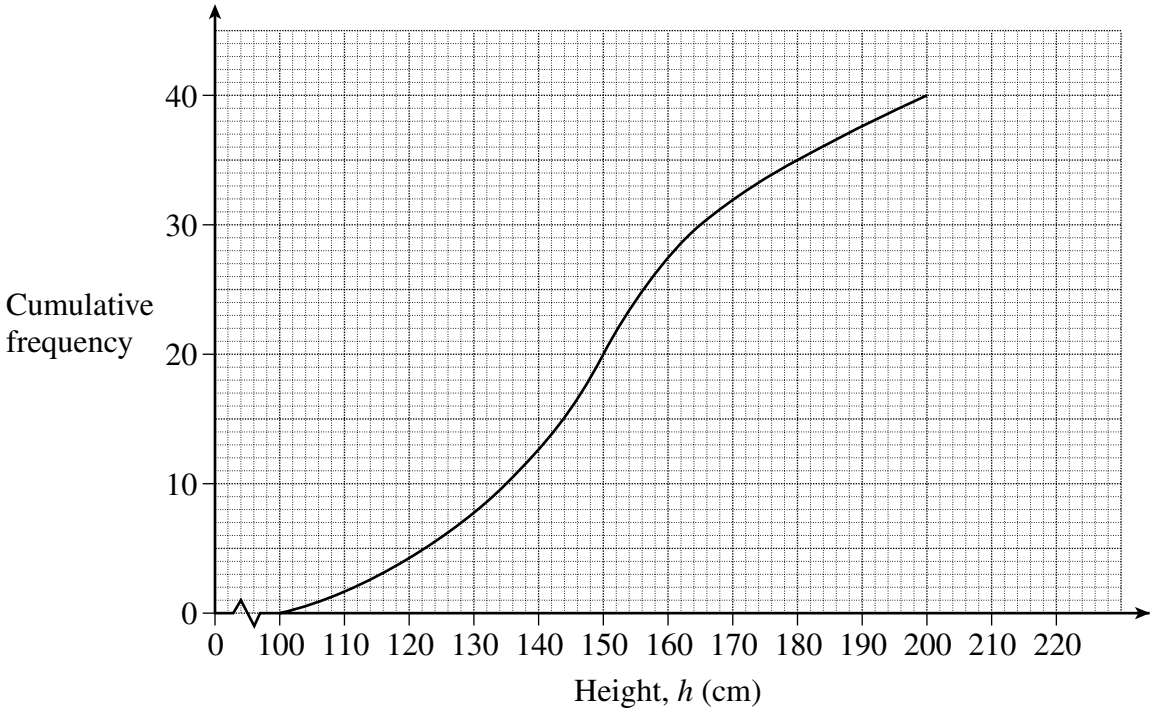
Answer ..... *(4 marks)*

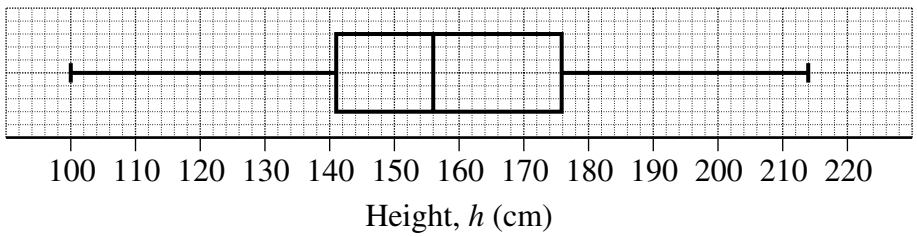
6

Turn over for the next question

3 The cumulative frequency diagram represents the heights of 40 sunflowers.



A second set of 40 sunflower plants was treated with fertiliser.
The box plot summarises the heights of the treated sunflowers.
Three sunflowers had the shortest height of 100 cm.



3 (a) Draw a cumulative frequency diagram for the treated sunflowers on the same grid as the first cumulative frequency diagram. *(4 marks)*

3 (b) Estimate the difference between the number of treated sunflowers and untreated sunflowers over a height of 180 cm.

.....

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

6

4 The table shows the bookings at a hotel for one month.

Single person	Couple	Family
27	70	103

The hotel manager wants to send questionnaires to a stratified sample of 30 of these bookings.

Calculate the number of each type of booking he should include.

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.....

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.....

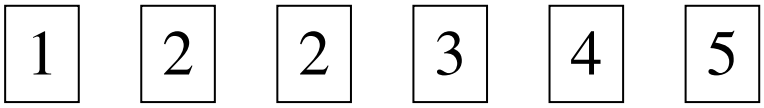
Answer Single person .....

Couple .....

Family ..... *(3 marks)*

3

5 Suzy has six numbered cards.



Suzy chooses two cards at random **without** replacement.

Calculate the probability that the numbers on the two cards add up to seven.

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

4

END OF SECTION A

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General Certificate of Secondary Education
March 2009

ASSESSMENT and QUALIFICATIONS ALLIANCE

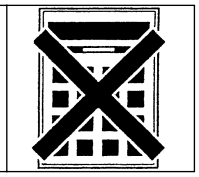
MATHEMATICS (MODULAR) (SPECIFICATION B) 43051/HB
Module 1 Higher Tier Section B

H

Tuesday 3 March 2009 2.05 pm to 2.35 pm

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.



Time allowed for Section B: 30 minutes

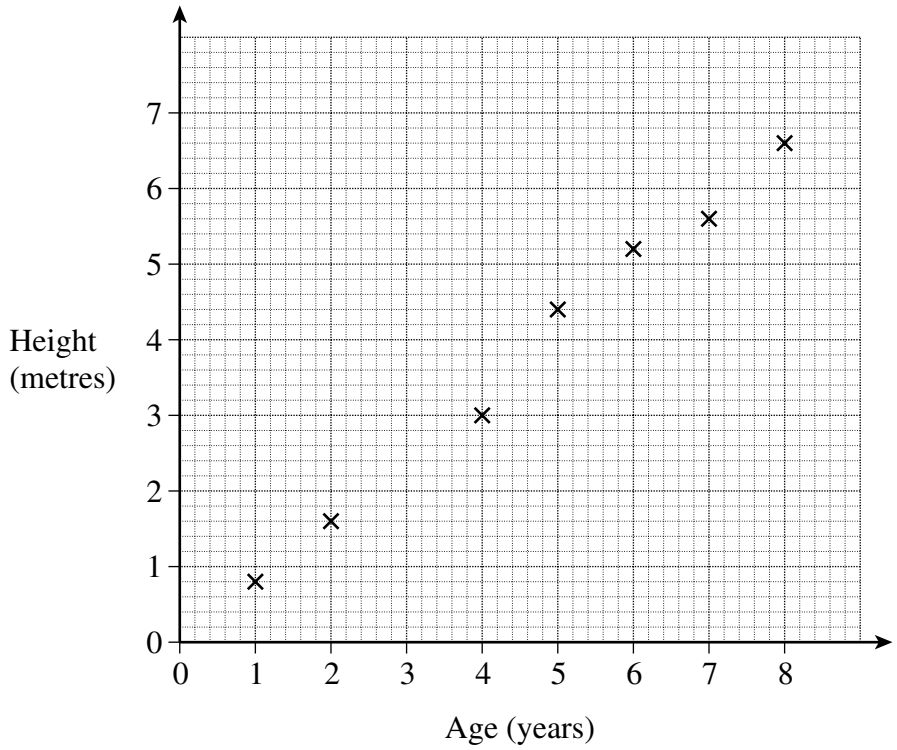
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins will not be marked.
- Do all rough work in this book.
- You may **not** 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 23.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

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

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

6 The scatter diagram shows the age (years) and the height (metres) of seven hawthorn trees.



6 (a) Describe the relationship shown by the scatter diagram.

.....

.....

(1 mark)

6 (b) Draw a line of best fit on the scatter diagram.

(1 mark)

6 (c) Use your line of best fit to estimate the height of a hawthorn tree of age 3 years.

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

3

7 Twenty children took part in a quiz.
The table shows the number of questions they answered incorrectly.

Number of incorrect answers	**Frequency**	
0	1	
1	2	
2	6	
3	8	
4	3	

Calculate the mean number of questions answered incorrectly.

.....

.....

.....

.....

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

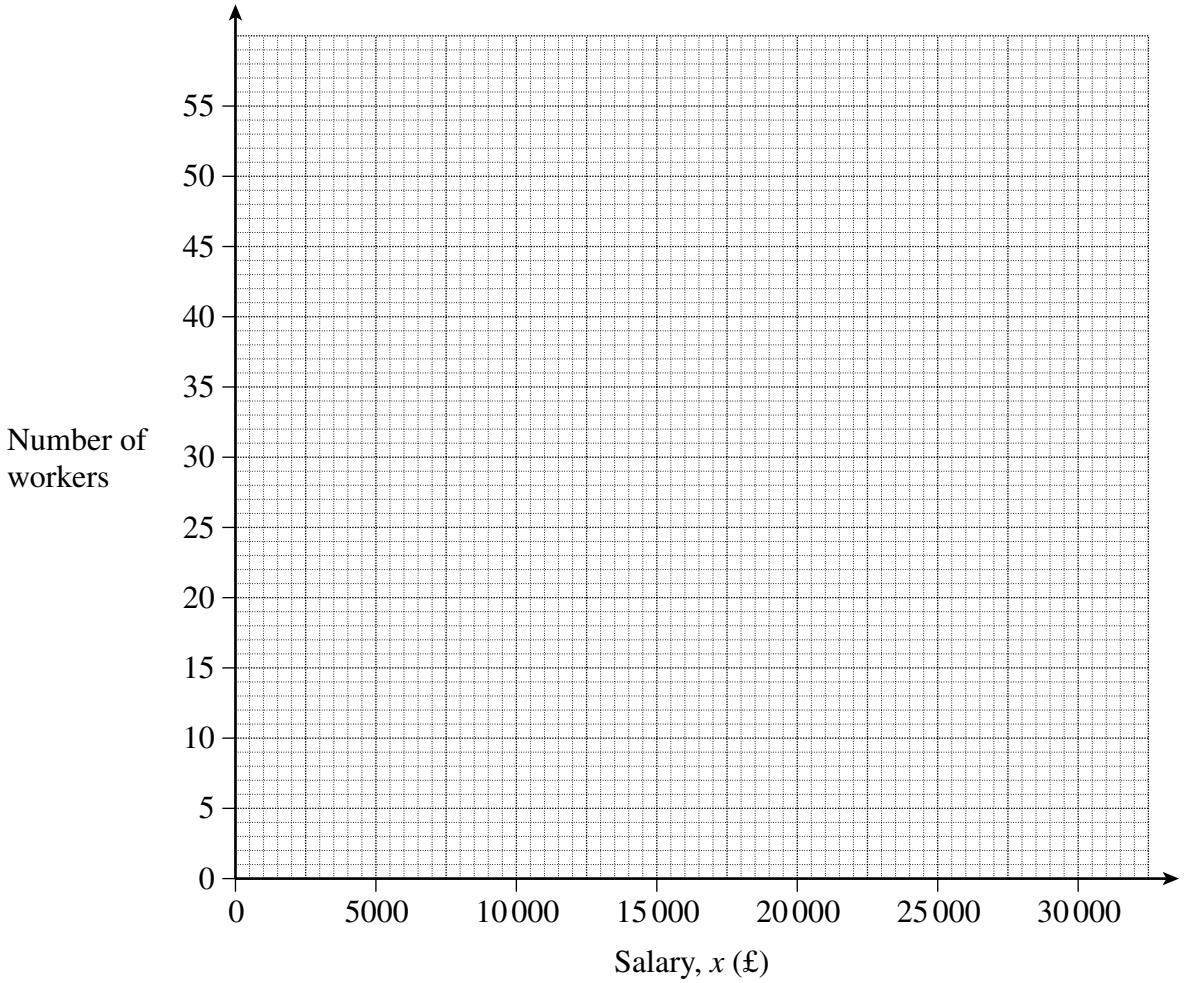
3

Turn over for the next question

8 The table shows the annual salaries of 100 office workers in Company A.

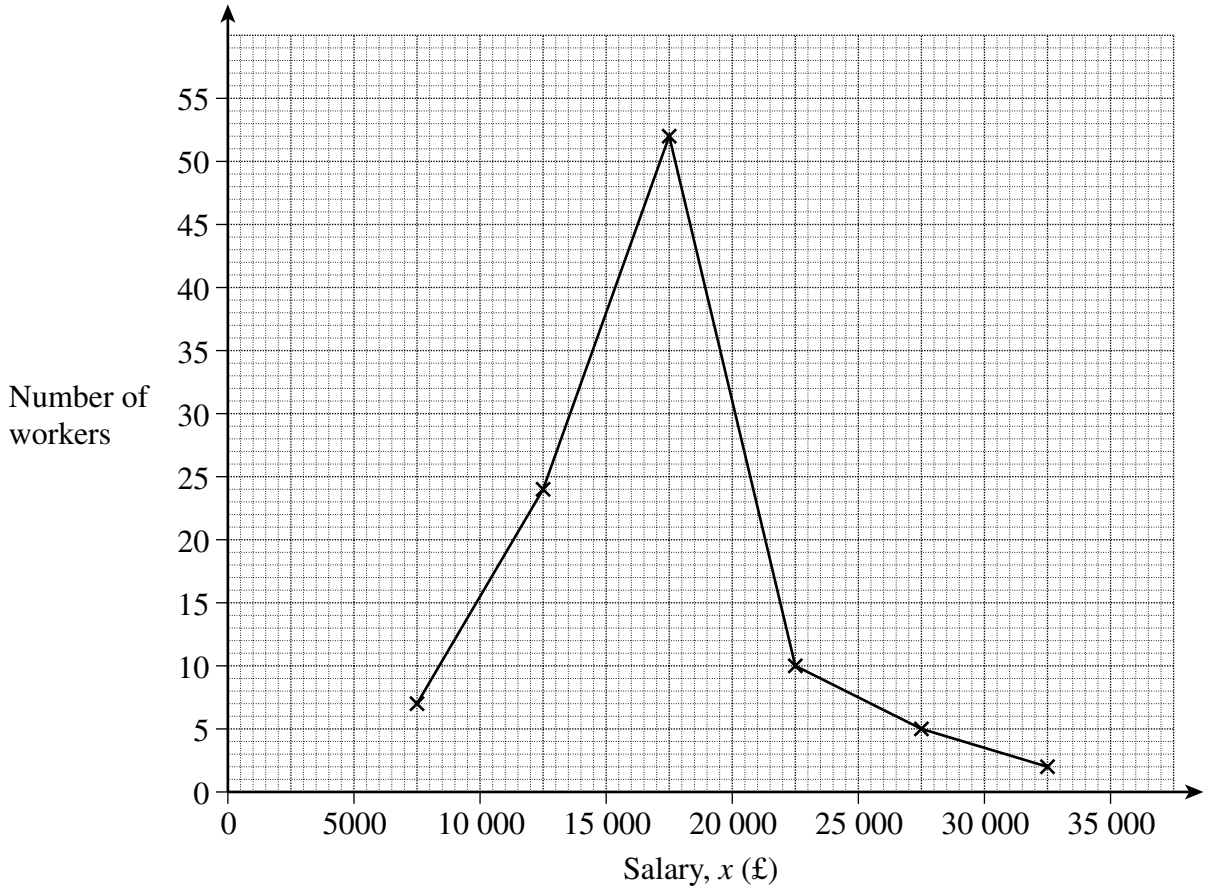
Salary, x (£)	**Number of workers**
$5000 < x \leqslant 10\,000$	5
$10\,000 < x \leqslant 15\,000$	53
$15\,000 < x \leqslant 20\,000$	21
$20\,000 < x \leqslant 25\,000$	18
$25\,000 < x \leqslant 30\,000$	3

8 (a) Draw a frequency polygon to represent this data.



(2 marks)

8 (b) The frequency polygon below shows the salary distribution of 100 office workers in Company B.



On average which set of office workers had higher salaries?
Give a reason for your answer.

Answer Company .....

Reason .....

.....

(2 marks)

4

9 Jason is carrying out a survey about how much exercise pupils in his school do.

9 (a) One of his questions is

"How many days a week do you exercise for 30 minutes or more?"

Design a response section for Jason's question.

(2 marks)

9 (b) Give **one** reason why Jason may **not** want to ask every pupil in the school.

.....

.....

(1 mark)

9 (c) Jason asks a group of Year 11 girls.

Give **one** disadvantage of his choice of sample.

.....

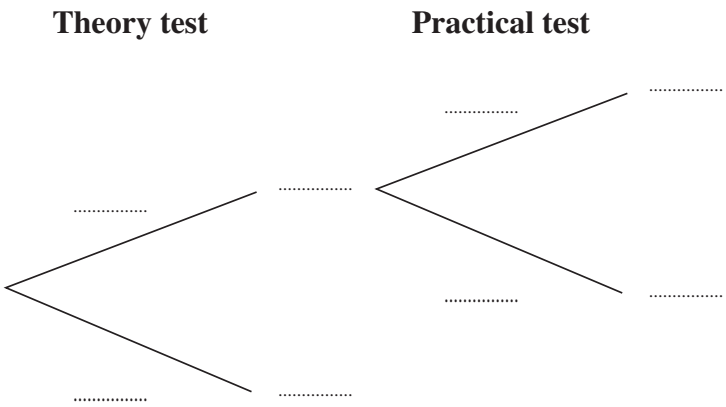
.....

(1 mark)

4

10 The probability that Hanif passes his driving theory test is 0.8
The probability that he passes his driving practical test is 0.7
He can only sit his practical test when he has passed his theory test.

10 (a) Complete and label the tree diagram to show this information.



(3 marks)

10 (b) Work out the probability that on his first attempt Hanif passes his theory test but fails his practical test.

.....

.....

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

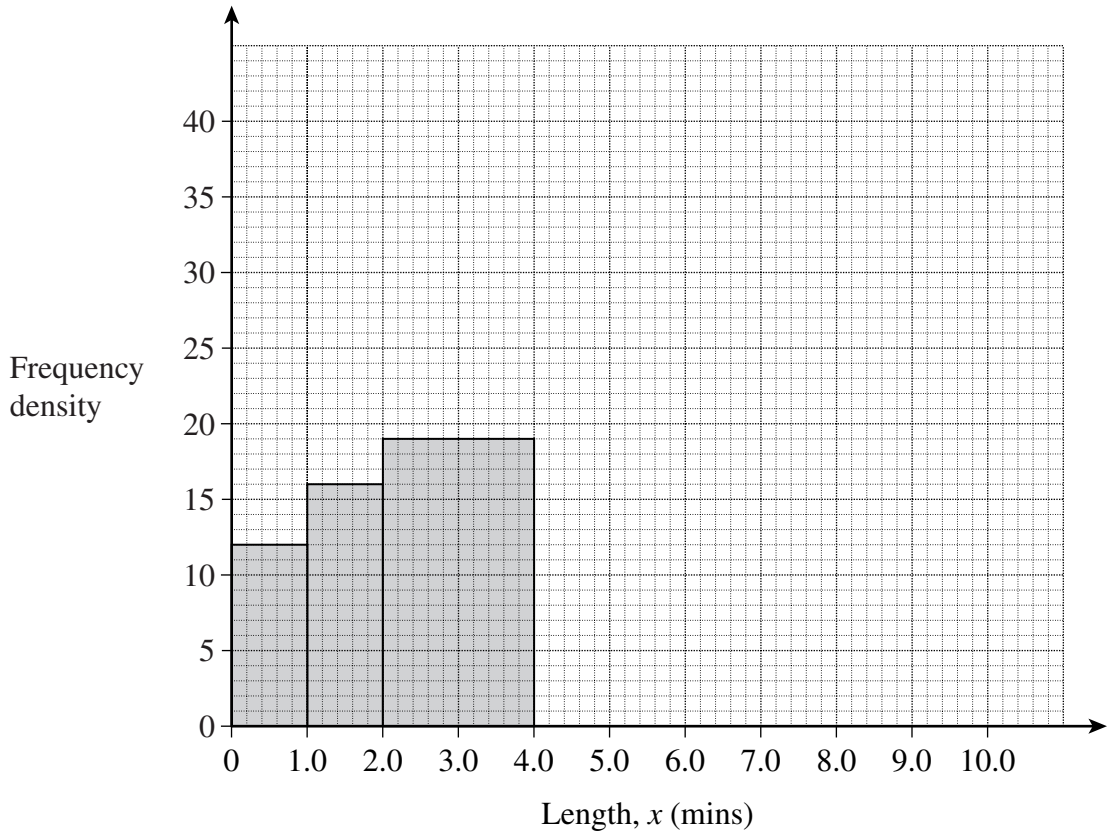
5

Turn over for the next question

11 (a) The lengths of calls at a call centre were recorded one Wednesday morning. The table shows the lengths of the first 100 calls.

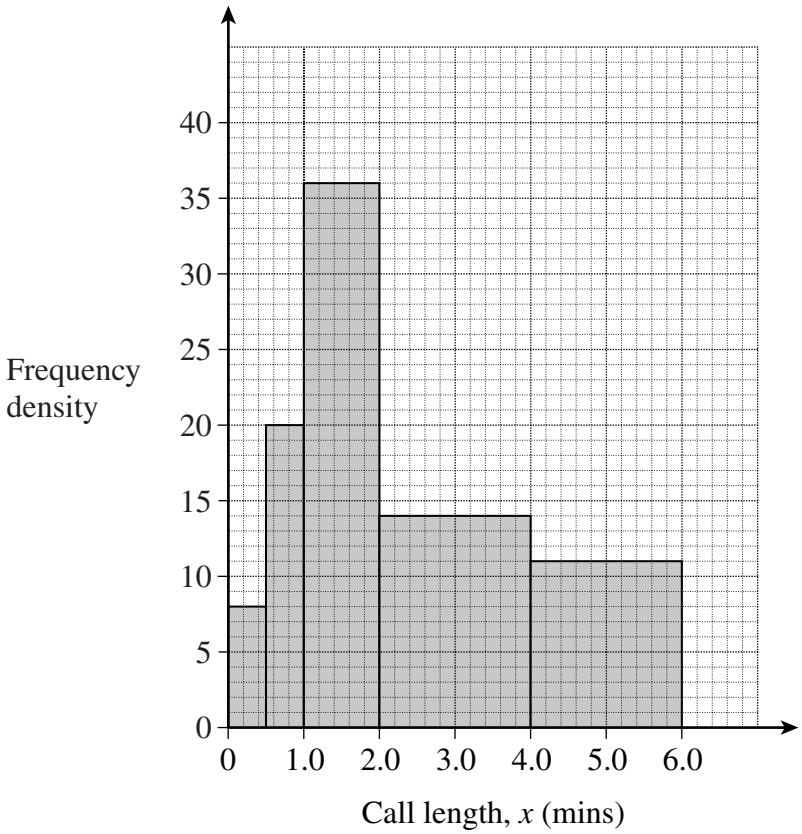
Length, x (mins)	**Frequency**
$0 < x \leqslant 1.0$	12
$1.0 < x \leqslant 2.0$	16
$2.0 < x \leqslant 4.0$	38
$4.0 < x \leqslant 6.0$	22
$6.0 < x \leqslant 10.0$	12

Complete the histogram to show this information.



(2 marks)

11 (b) This histogram represents the lengths of 100 calls on Wednesday evening.



Jake says 'There were more calls lasting less than one minute in the evening than in the morning.'

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

.....

.....

.....

(2 marks)

4

END OF QUESTIONS

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