Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

For Examiner's Use

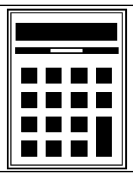
General Certificate of Secondary Education
March 2008

MATHEMATICS (MODULAR) (SPECIFICATION B) 43051/HA
Module 1 Higher Tier Section A
Non-coursework Specification

H

Monday 3 March 2008 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

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

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.
- Answer the questions in the spaces provided.
- 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.

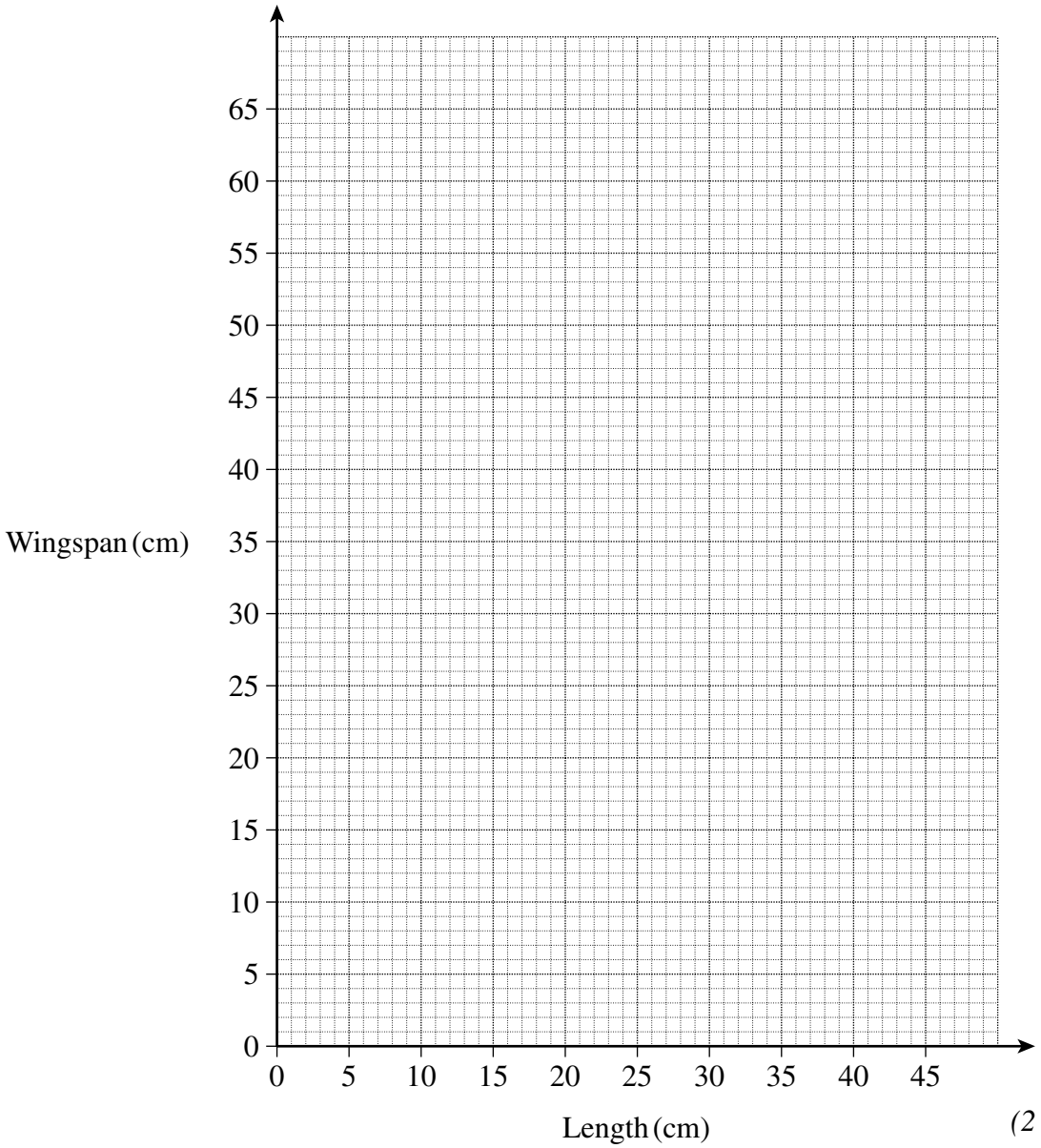
Advice
- In all calculations, show clearly how you work out your answer.

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

1 The length and wingspan, in centimetres, of seven common garden birds is shown in the table.

Bird	Length (cm)	Wingspan (cm)
Starling	21	40
Blackbird	25	36
Blue Tit	11	19
Greenfinch	15	26
Dove	32	51
Sparrow	15	23
Great Tit	14	24

(a) Plot the data as a scatter graph on the grid below.



(2 marks)

(b) Describe the strength and type of correlation.

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(1 mark)

(c) Draw a line of best fit on your scatter graph.

(1 mark)

(d) Use your line of best fit to estimate the wingspan of a thrush whose length is 20 cm.

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

(e) It is **not** sensible to use your line of best fit to estimate the wingspan of a pigeon whose length is 41 cm.

Explain why.

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(1 mark)

6

2 Supermarket shoppers were asked which day they prefer to do their shopping. The two-way table shows some of the results.

Day	Males	Females	Total
Mon – Fri		53	87
Sat – Sun			
Total	50		150

Fill in **all** the missing values in the table.

(3 marks)

3

3 A factory manager surveys the owners of the cars parked in the car park.

One of the questions is:

> When you drive to work how many people, including yourself, are in your car?

The responses are summarised in the table below.

Number of people	Number of cars
1	42
2	26
3	12
4	2
5	0
6	1
Total	83

(a) Calculate the mean number of people per car.

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

(b) The manager wants to find out if car owners are prepared to car-share.

Write a suitable question with a response section to find out which days from Monday to Friday the owners will car-share.

Question .....

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Response .....

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(2 marks)

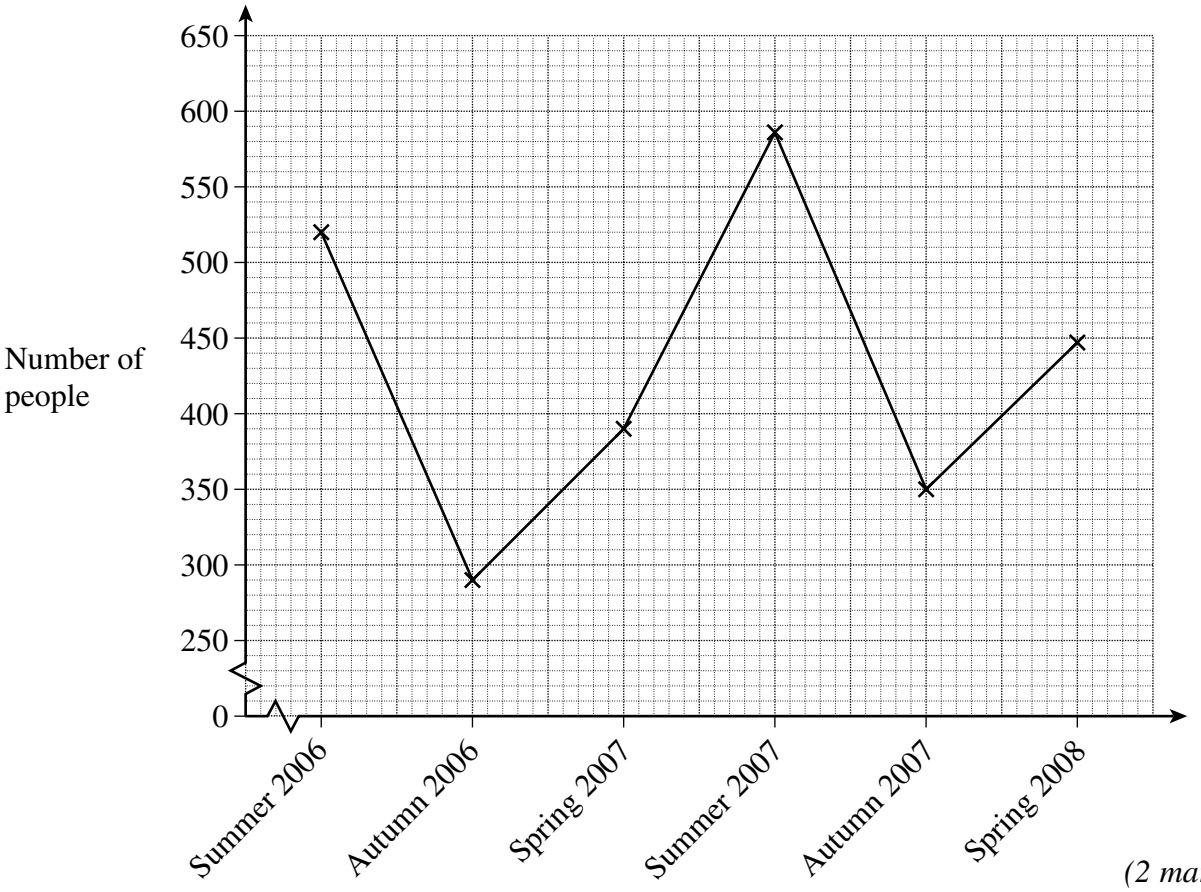
5

Turn over for the next question

4 A college records the number of people who sign up for adult education classes each term from Summer 2006 to Spring 2008.
The table shows the results and the 3-point moving averages.

Term	**Summer 2006**	**Autumn 2006**	**Spring 2007**	**Summer 2007**	**Autumn 2007**	**Spring 2008**
Number of people	520	290	390	586	350	447
3-point moving average		400	422	442	461	

(a) Plot the moving averages on the graph below.



(2 marks)

(b) Use a trend line to calculate an estimate of the number of people who sign up for adult education classes in the Summer 2008 term.

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

5

5 The type of people watching a film at a cinema is shown in the table.

	Male	**Female**
Adult	21	14
Child	10	5

Two of these people are chosen at random to receive free cinema tickets.

Calculate the probability that the two chosen people are adults of the same gender.

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

4

END OF SECTION A

There are no questions printed on this page

Surname		Other Names	
Centre Number			Candidate Number									
Candidate Signature												

General Certificate of Secondary Education
March 2008

ASSESSMENT and QUALIFICATIONS ALLIANCE

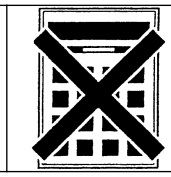
MATHEMATICS (MODULAR) (SPECIFICATION B) 43051/HB
Module 1 Higher Tier Section B
Non-coursework Specification

H

Monday 3 March 2008 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 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.
- Answer the questions in the spaces provided.
- 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 headteacher of a school sends a questionnaire to each head of department.

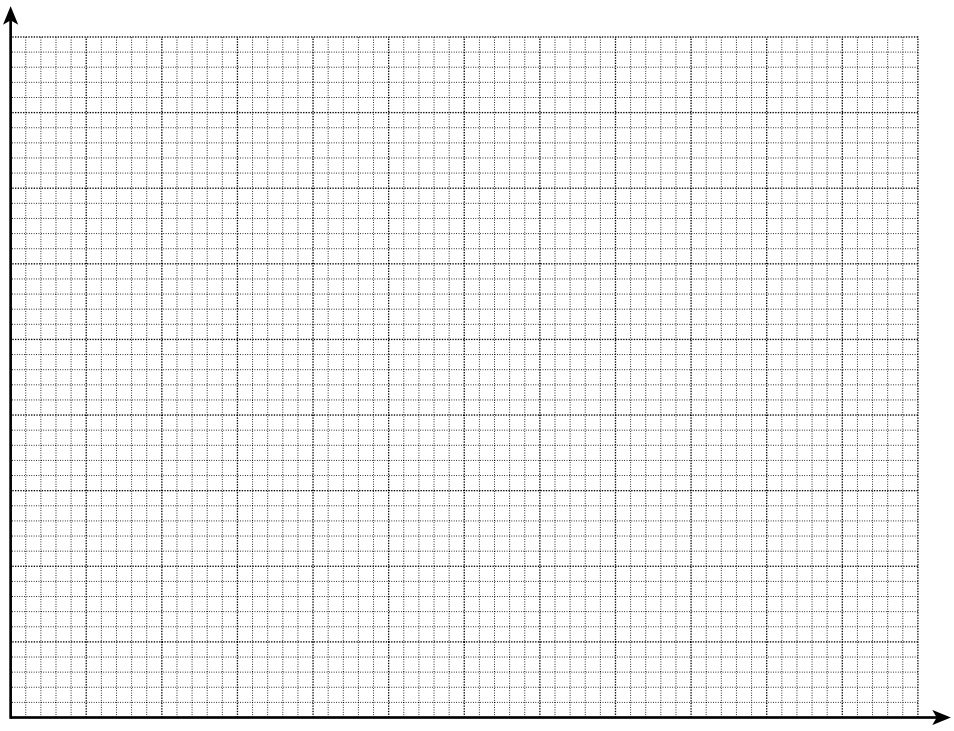
One of the questions is:

> How many hours do you think you are working each week?

The results are shown in the table.

Hours worked each week, *t*	**Number of heads of department**
$25 \leqslant t < 30$	0
$30 \leqslant t < 35$	2
$35 \leqslant t < 40$	3
$40 \leqslant t < 45$	8
$45 \leqslant t < 50$	6
$50 \leqslant t < 55$	1

(a) Draw a frequency diagram to represent this data.



Hours worked each week, *t*

(3 marks)

(b) There are 80 teachers in the school.

Use the figures in the table to calculate an estimate of how many teachers in the school are working 40 or more hours each week.

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

(c) Explain why the answer to part (b) is likely to be unrealistic.

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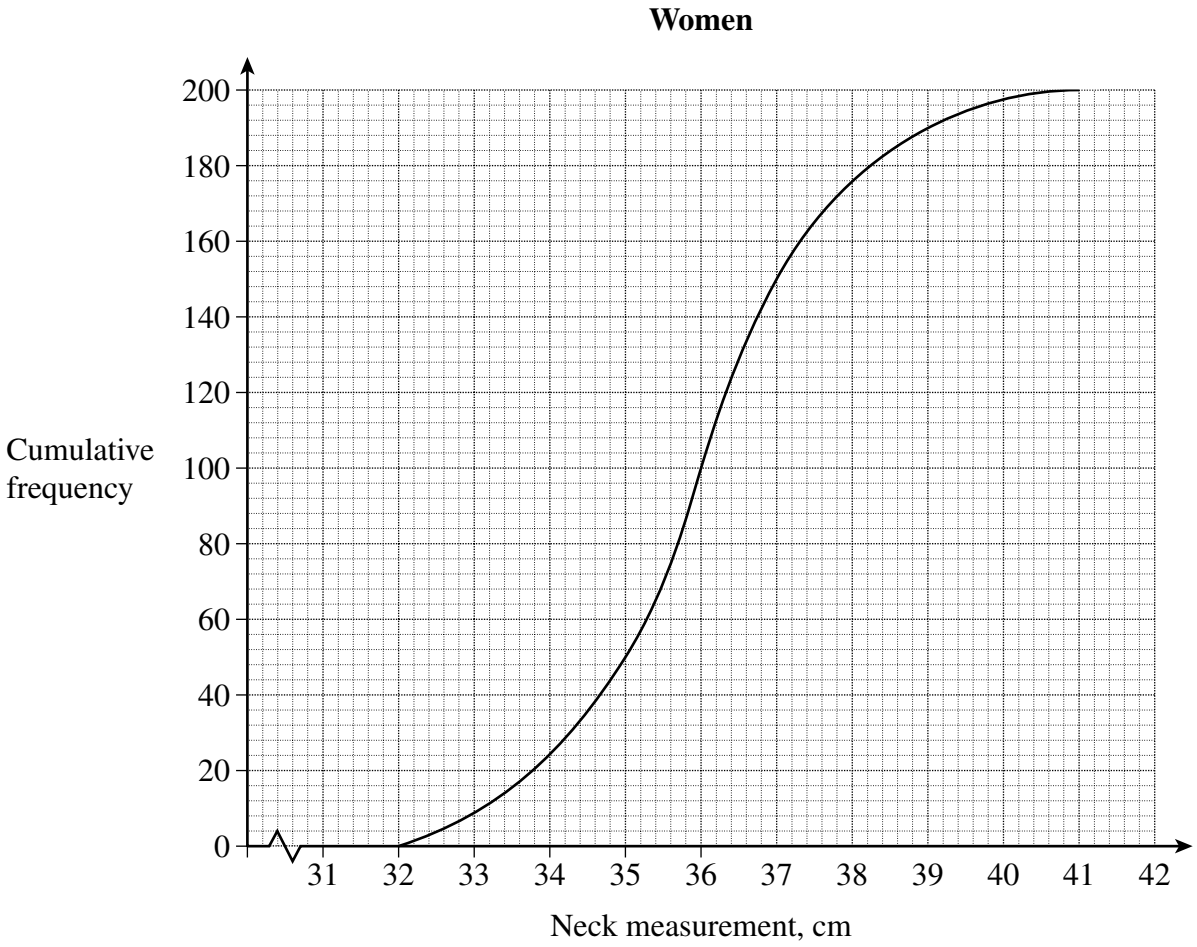
(1 mark)

7

Turn over for the next question

7 The neck measurements of 200 women are represented by the cumulative frequency diagram.



Use the cumulative frequency diagram to find

(a) the median neck measurement

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

(b) the interquartile range of the neck measurements

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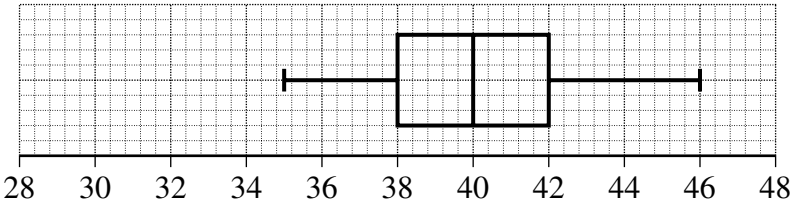
Answer ..... cm *(2 marks)*

(c) the number of women with a neck measurement of less than 34 cm.

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

(d) The neck measurements of 200 men are represented by the box plot.

Men



Neck measurements, cm

Write down **two** comparisons between the women's and the men's neck measurements.

Comparison 1 .....

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Comparison 2 .....

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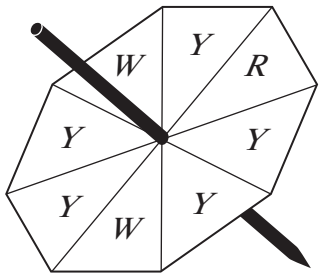
(2 marks)

6

Turn over for the next question

8 Jenny has a fair spinner.

The spinner has eight equal sections.
One is red (R), two are white (W) and the rest are yellow (Y).



(a) Jenny says that whenever she spins this spinner eight times it will land on white exactly twice.

Is Jenny correct?

Yes ☐ No ☐

Explain your answer.

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(1 mark)

(b) Jenny spins the spinner twice.

Calculate the probability that the spinner lands on white both times.

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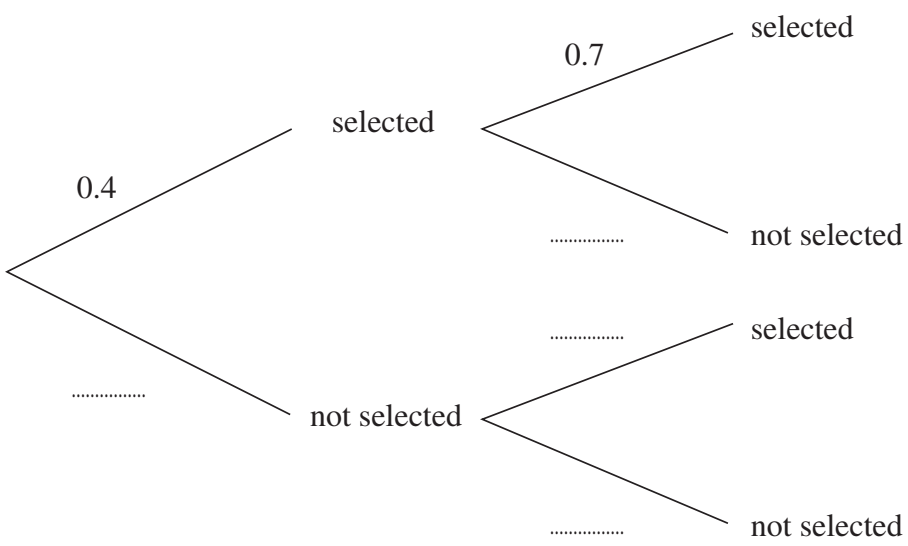
Answer ..... *(2 marks)*

3

9 David and Alan apply to join the army.
The probability that David is selected is 0.4
The probability that Alan is selected is 0.7

(a) Complete the tree diagram with all the probabilities.



(1 mark)

(b) Calculate the probability that at least one of them is selected.

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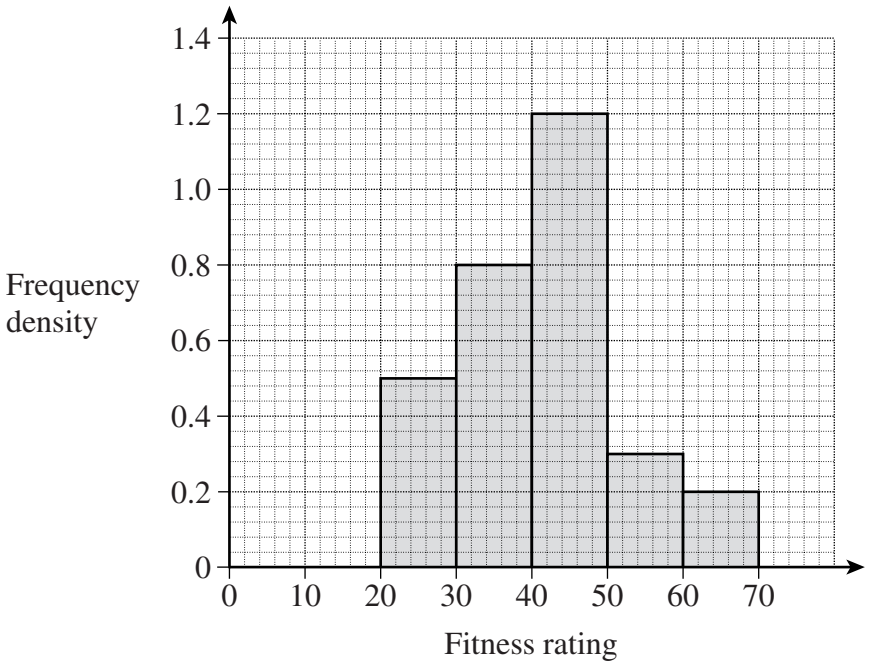
Answer ..... *(3 marks)*

4

Turn over for the next question

10 The histogram shows the distribution of fitness ratings for a group of young soldiers.



Soldiers with a fitness rating between 42 and 56 are classified as average.

Calculate an estimate of how many soldiers are classified as average.

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

3

END OF QUESTIONS