Surname		Other Names				
Centre Number				Candidate Number		
Candidate Signature						

General Certificate of Secondary Education
November 2003

AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

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

H

Monday 17 November 2003 9.00 am to 9.25 am

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

Time allowed for Section A: 25 minutes

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			

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, make sure that you hand in **both** Section A and Section B securely tagged 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.

33001/HA

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

1 A school has 1260 students.

The probability that a student at the school has blue eyes is $\frac{2}{5}$.

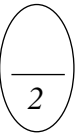Calculate how many students at the school have blue eyes.

....

....

....

....

Answer .... *(2 marks)*

2 The table shows the costs of the heating bills for a house.

Date of bill	March 2002	June 2002	Sept 2002	Dec 2002	March 2003	June 2003	Sept 2003
Cost (£)	72	40	28	60	92	56	40
Four-point moving average (£)	50						

(a) You are given that the first four-point moving average is £50.

Calculate **all** the other four-point moving averages.

....

....

....

....

....
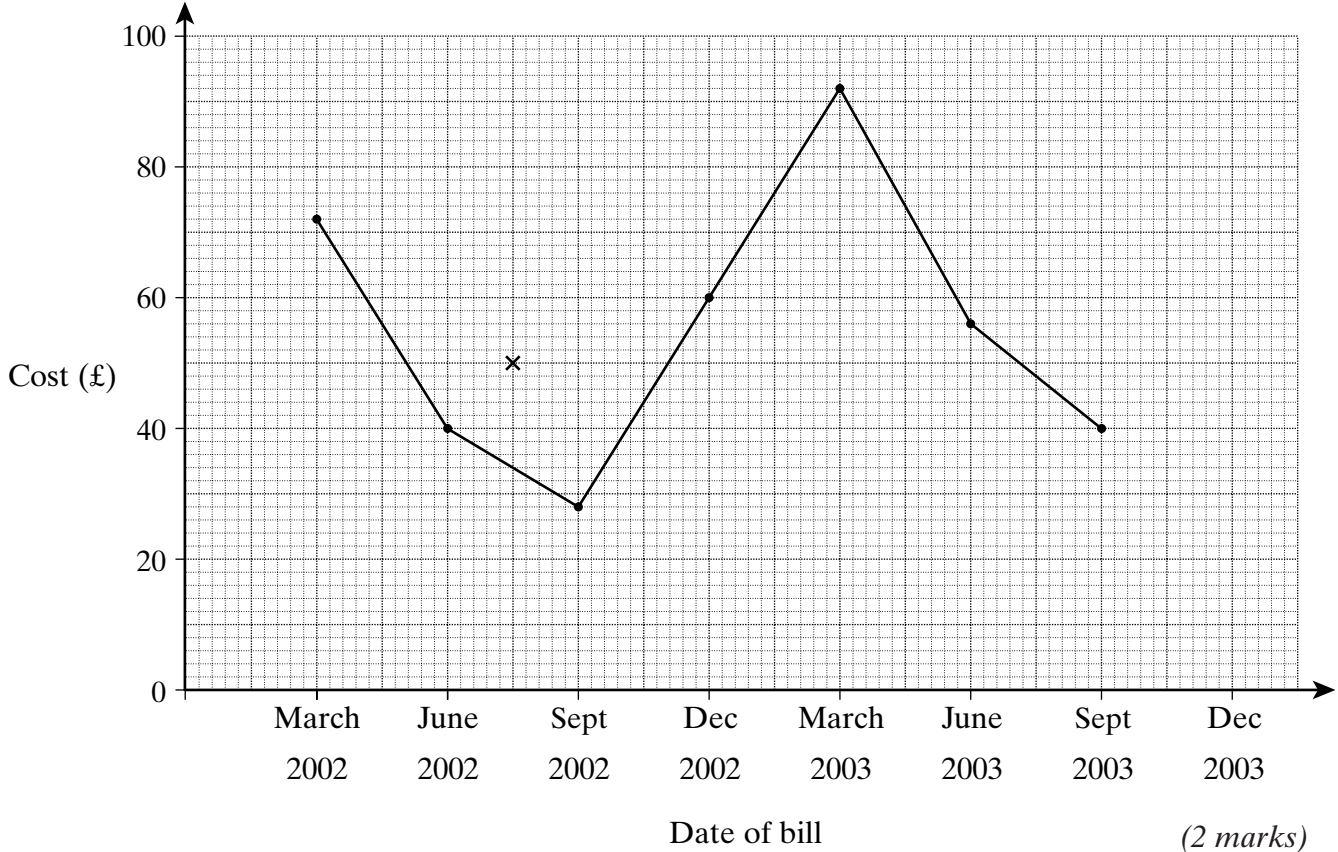
(4 marks)

(b) The time series graph shows the original data.
The first four-point moving average, £50, has also been plotted.

Plot **all** the other moving averages.

Date of bill

(2 marks)

(c) Draw a trend line and use it to estimate the cost of the December 2003 heating bill.
You **must** show your working.

....

....

....

....

....

Answer £ .... *(3 marks)*

3 A bag contains 4 red, 3 yellow and 2 purple discs.
A disc is taken, at random, from the bag and is **not** replaced.
A second disc is then taken, at random, from the bag.

Calculate the probability that the two discs taken from the bag are
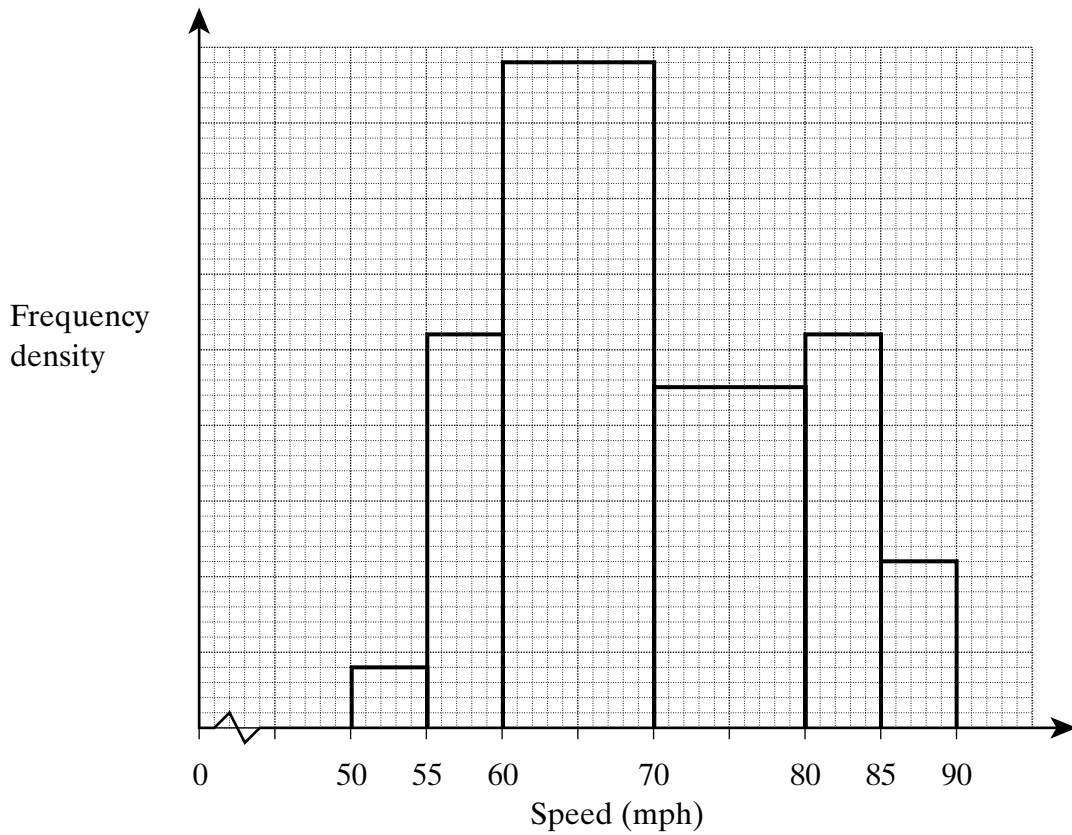
(a) both red,

....

....

....

....

Answer .... *(2 marks)*

(b) different colours.

....

....

....

....

....

Answer .... *(3 marks)*

4 The police carried out speed-checks on a large sample of cars on the M1 motorway. The histogram shows the results.

Frequency density

Speed (mph)

There were 90 cars travelling between 50 and 60 mph.

Use the histogram to calculate how many cars were travelling between 70 and 90 mph.

....

....

....

....

....

....

....

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

END OF SECTION A

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

General Certificate of Secondary Education
November 2003

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

H

Monday 17 November 2003 9.30 am to 9.55 am

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, make sure that you hand in **both** Section A and Section B securely tagged 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.

33001/HB

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

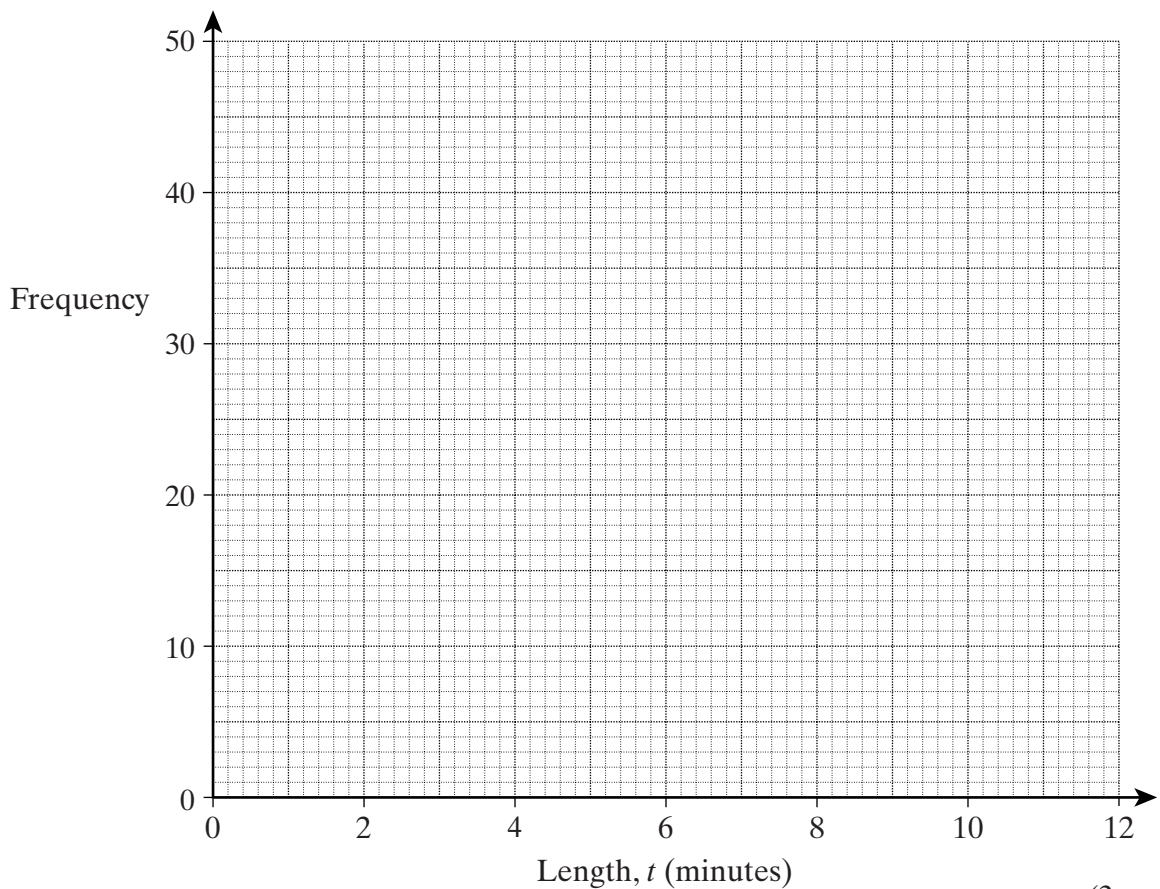**5** Carla and Debbie are telephone sales assistants.

The length and frequency of telephone calls made by Carla during one day are shown in the table.

Length, t (minutes)	Frequency
$0 < t \leqslant 2$	25
$2 < t \leqslant 4$	40
$4 < t \leqslant 6$	18
$6 < t \leqslant 8$	10
$8 < t \leqslant 10$	4

(a) Draw a frequency polygon for this data.

CARLA

(2 marks)

(b) The frequency polygon below shows the length and frequency of telephone calls made by Debbie during the same day.
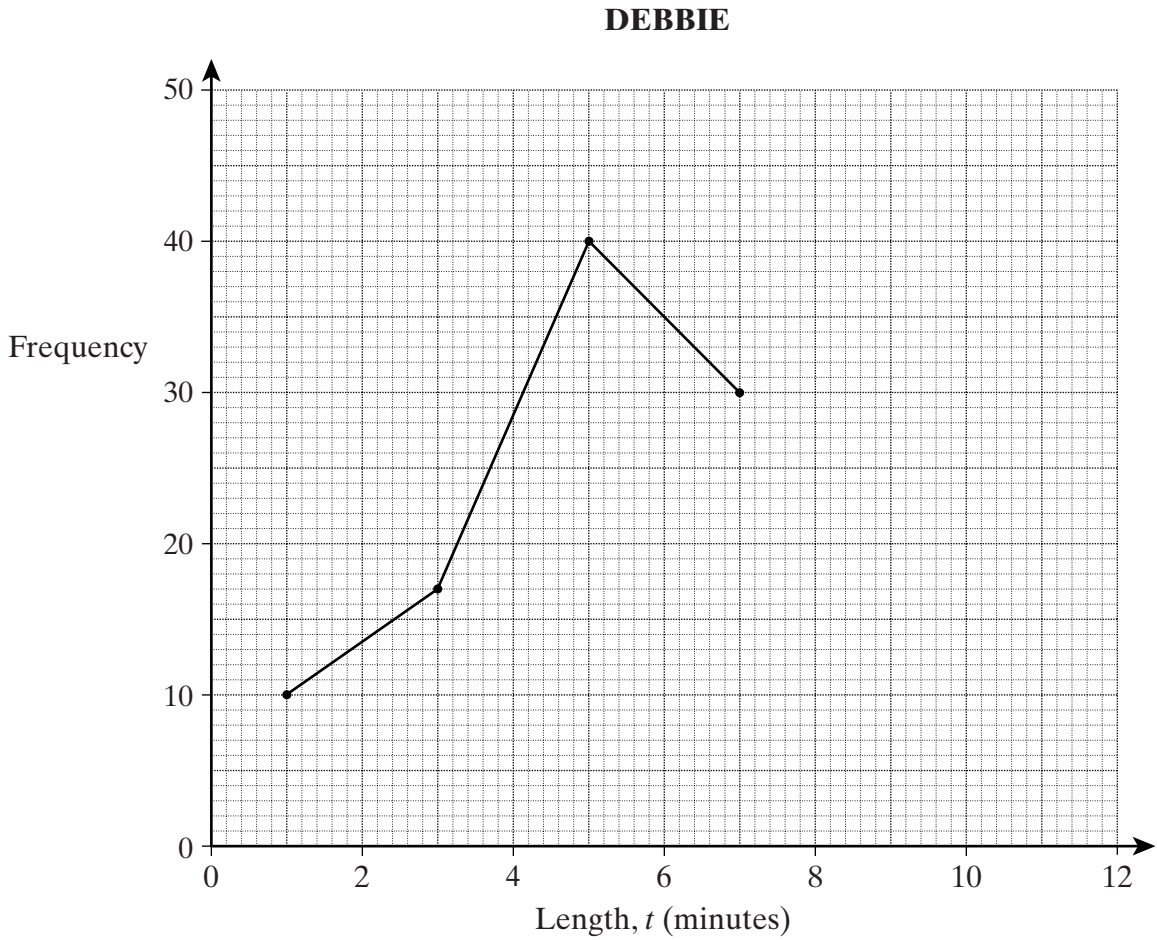
DEBBIE

Write down **two** comparisons between the lengths of telephone calls made by Carla and Debbie that day.

Comparison 1 ....

....

....

Comparison 2 ....

....

....

(2 marks)

Turn over ▶

6 (a) Explain how you could distribute 50 questionnaires randomly to pupils from a school of 1000 pupils.

....

....

....

(1 mark)

(b) Jane stood outside the school library and collected the views of 50 pupils.

Explain why her method of obtaining data will **not** give a random sample.

....

....

....

(1 mark)

(c) Sahima decides to take a stratified sample, of 50 pupils, by year group from the 1000 pupils in the school.

The table shows the number of pupils in each year group at the school.

Year	7	8	9	10	11
Number of pupils	167	200	230	210	193

Calculate the number of pupils that Sahima should choose from each year group.

....

....

....

....

....

....

Answer   Year 7 ....

Year 8 ....

Year 9 ....

Year 10 ....

Year 11 ....
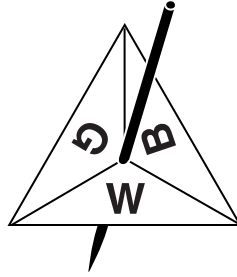
(4 marks)

6

Turn over ▶

7 A triangular spinner has sections coloured white (W), green (G) and blue (B).

The spinner is spun 20 times and the colour it lands on each time is recorded.

| W | W | B | G | G | W | B | G | G | W |

| G | B | G | B | G | W | G | B | G | B |

(a) Complete the relative frequency table.

Colour	White (W)	Green (G)	Blue (B)
Relative frequency			

(2 marks)

(b) The table below shows the relative frequencies after this spinner has been spun 100 times.

Colour	White (W)	Green (G)	Blue (B)
Relative frequency	$\frac{21}{100}$	$\frac{52}{100}$	$\frac{27}{100}$

Which of the two relative frequencies for white gives the better estimate of the probability of the spinner landing on white?
Give a reason for your answer.

....

....

....

....

(2 marks)

8 Jean enters an archery competition.

If it is raining the probability that she hits the target is 0.4

If it is not raining the probability that she hits the target is 0.7

The probability that it rains on the day of the competition is 0.2

(a) Draw a fully labelled tree diagram showing all the probabilities.

(3 marks)

(b) Calculate the probability that Jean hits the target with her first arrow in the competition.

....

....

....

....

....

Answer ....   *(3 marks)*

END OF QUESTIONS