General Certificate of Secondary Education
November 2009

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

H

Friday 13 November 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.

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

1 Fifty children were asked how many pets they owned.
The results are shown in the table.

Number of pets	Number of children	
0	8	
1	17	
2	14	
3	9	
4	2	

Calculate the mean number of pets owned per child.

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Answer .... *(3 marks)*

3

2 There are 500 plastic shapes in a box.
The shapes are circles, triangles, squares and rectangles.

A shape is chosen at random from the box.
The table shows some of the probabilities of shapes being chosen.

Shape	Probability
Circle	0.2
Triangle	
Square	
Rectangle	0.1

The probability of choosing a triangle is equal to the probability of choosing a square.

Calculate the number of triangles in the box.

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Answer .... *(4 marks)*

4

Turn over for the next question

Turn over ▶

*Areas outside
the box will
not be scanned
for marking*

3 There are 200 counters in a bag.
In a trial a counter is chosen, its colour is noted, and then the counter is replaced.
Results are recorded after each set of ten trials.
The graph shows the relative frequency of green.
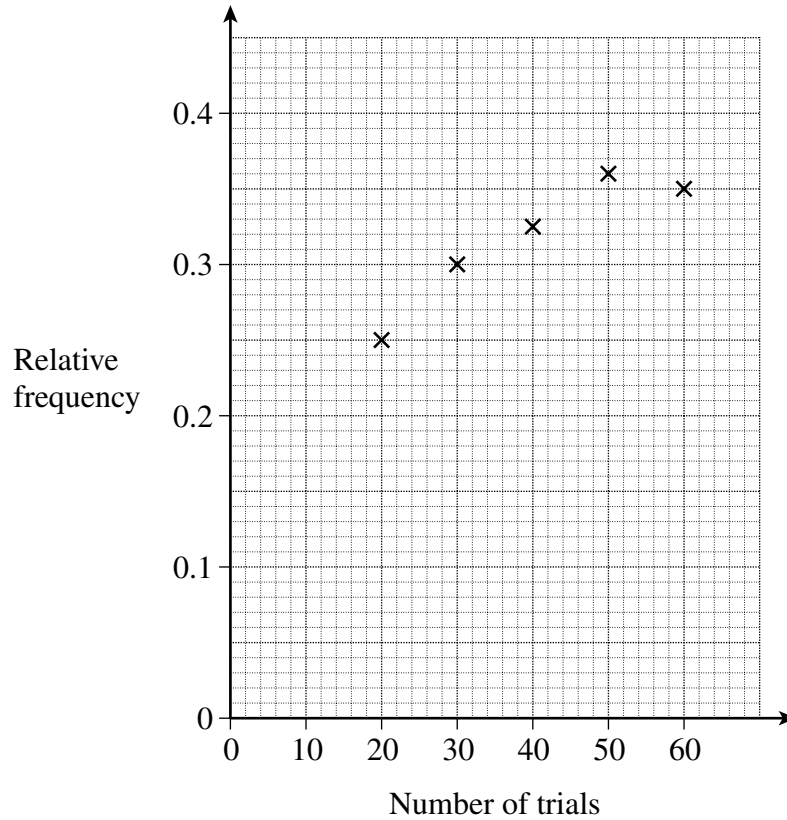
3 (a) In the first ten trials four green counters were chosen.

   Write down the relative frequency of green and plot this result on the graph.

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   Answer .... *(2 marks)*

3 (b) What is the best estimate, from the graph, of the probability of choosing a green counter?
Give a reason for your answer.

Answer ....

Reason ....

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(2 marks)

3 (c) Use your answer to part (b) to estimate the number of green counters in the bag.

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Answer .... *(2 marks)*
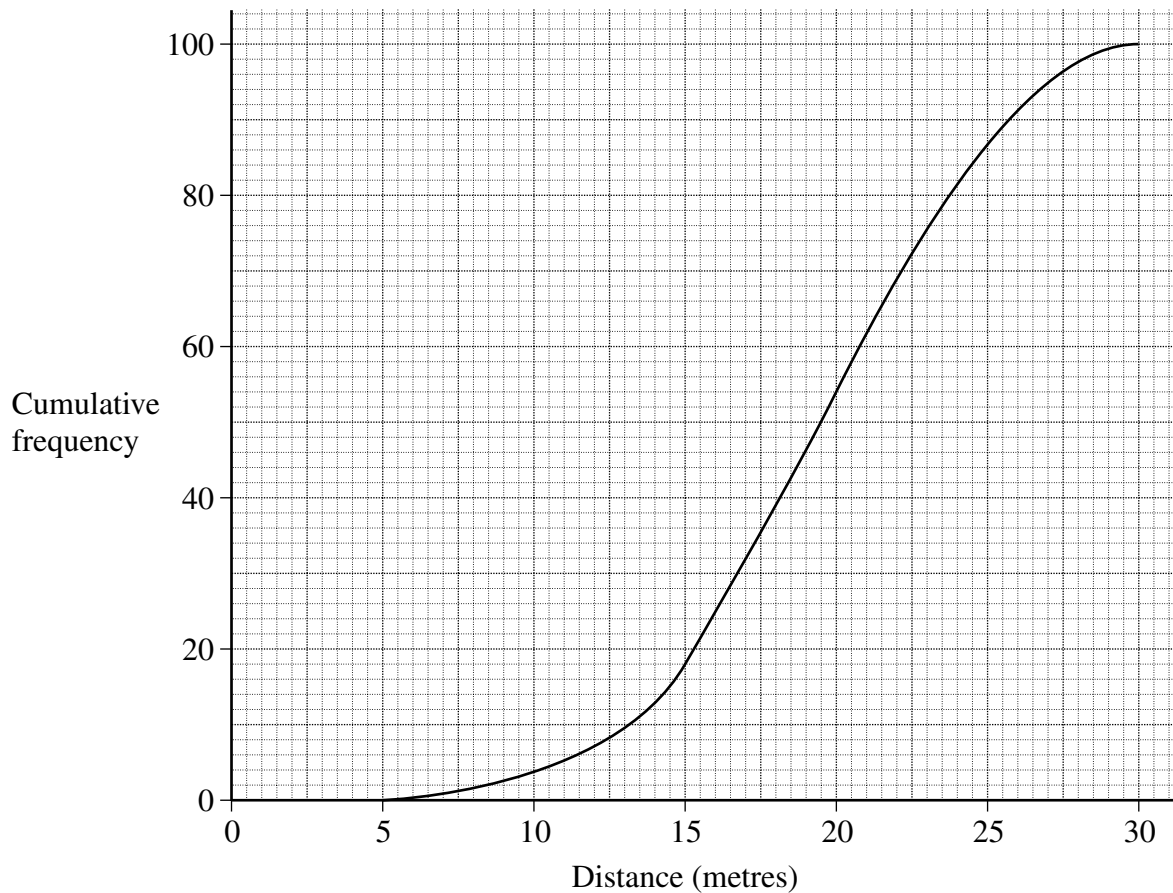
6

Turn over for the next question

Turn over ▶

4 The cumulative frequency diagram of the distances that 100 boys threw a tennis ball is shown.
The shortest distance thrown was 6 metres and the longest distance thrown was 30 metres.

4 (a) How many boys threw the ball further than 15 metres?

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Answer .... *(1 mark)*

4 (b) Write down the median distance thrown.

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

4 (c) Work out the interquartile range of the distances thrown.

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

4 (d) The box plot of the distances that 100 girls threw a tennis ball is shown.

Distance (metres)
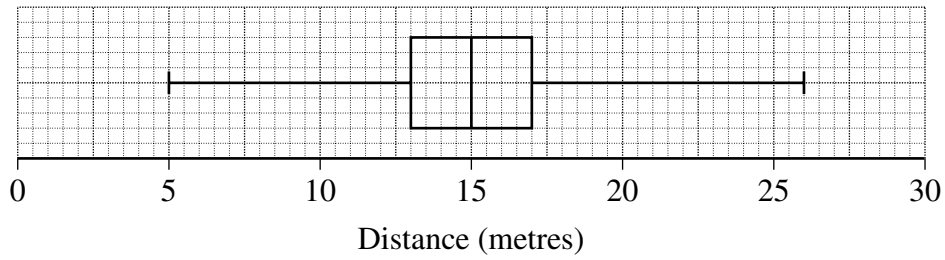
4 (d) (i) On average, did the girls throw the ball further?
Show working to support your answer.

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(1 mark)

4 (d) (ii) Were the girls more consistent in their throws?
Show working to support your answer.

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(1 mark)

6

Turn over for the next question

Turn over ▶

5 The table shows the employment status of 6000 people aged between 16 and 25.

	Employed	**Student**	**Unemployed**
Male	1430	1285	375
Female	1192	960	758

A sample of 100 of these people is chosen, stratified by employment status and gender.

5 (a) Calculate the number of employed males in the stratified sample.

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Answer .... *(2 marks)*

5 (b) Calculate the number of people in the sample who are female or students.

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Answer .... *(2 marks)*

4

END OF SECTION A