

Surname					Other Names				
Centre Number					Candidate Number				
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General Certificate of Secondary Education  
March 2004



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

**H**

Monday 1 March 2004 9.00 am to 9.25 am

<p><b>In addition to this paper you will require:</b></p> <ul style="list-style-type: none"> <li>• a calculator</li> <li>• mathematical instruments</li> <li>• a treasury tag.</li> </ul>	
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For Examiner's Use			
Section A		Section B	
Number	Mark	Number	Mark
1		4	
2		5	
3		6	
		7	
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**

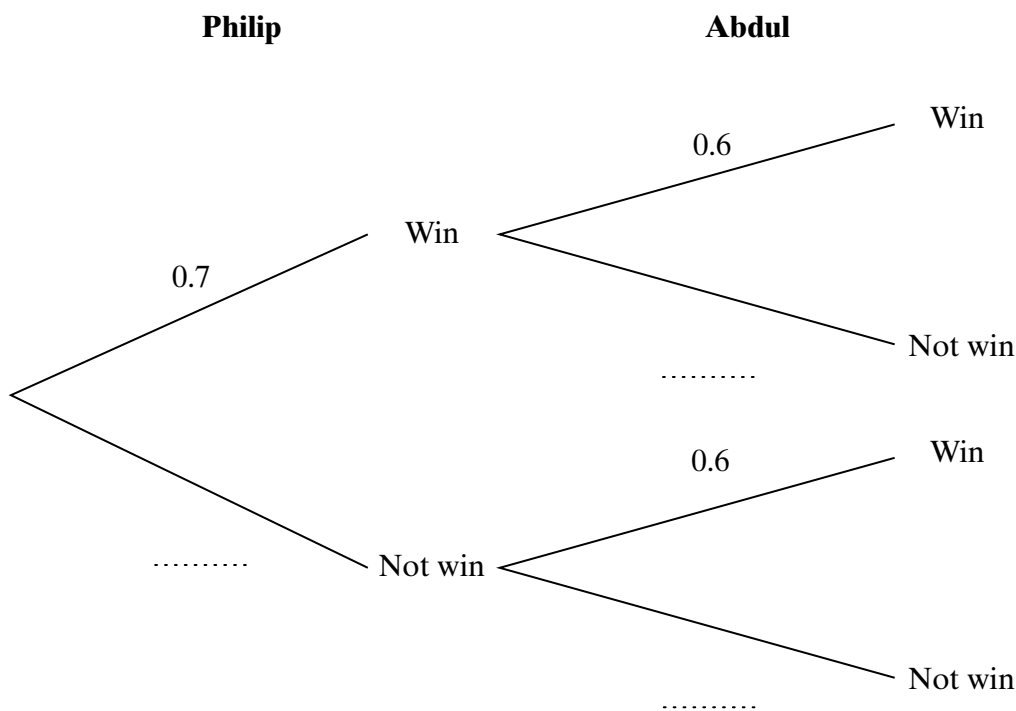
- In all calculations, show clearly how you work out your answer.

**NO QUESTIONS APPEAR ON THIS PAGE**

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

- 1 Philip and Abdul run in different races.  
The probability that Philip wins his race is 0.7  
The probability that Abdul wins his race is 0.6

(a) Fill in the missing probabilities on the tree diagram.



(1 mark)

(b) Calculate the probability that only one of the boys wins his race.

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Answer ..... (3 marks)



Turn over ►

2 The table shows the age, in years, of workers in a factory.

Age, $x$ (years)	Number of workers
$15 \leq x < 20$	4
$20 \leq x < 25$	10
$25 \leq x < 30$	6
$30 \leq x < 40$	22
$40 \leq x < 60$	8

(a) Calculate an estimate of the mean age of these workers.

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Answer ..... years (4 marks)

(b) Which class interval contains the median age of these workers?  
You **must** show your working.

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Answer .....  $\leq x <$  ..... (2 marks)

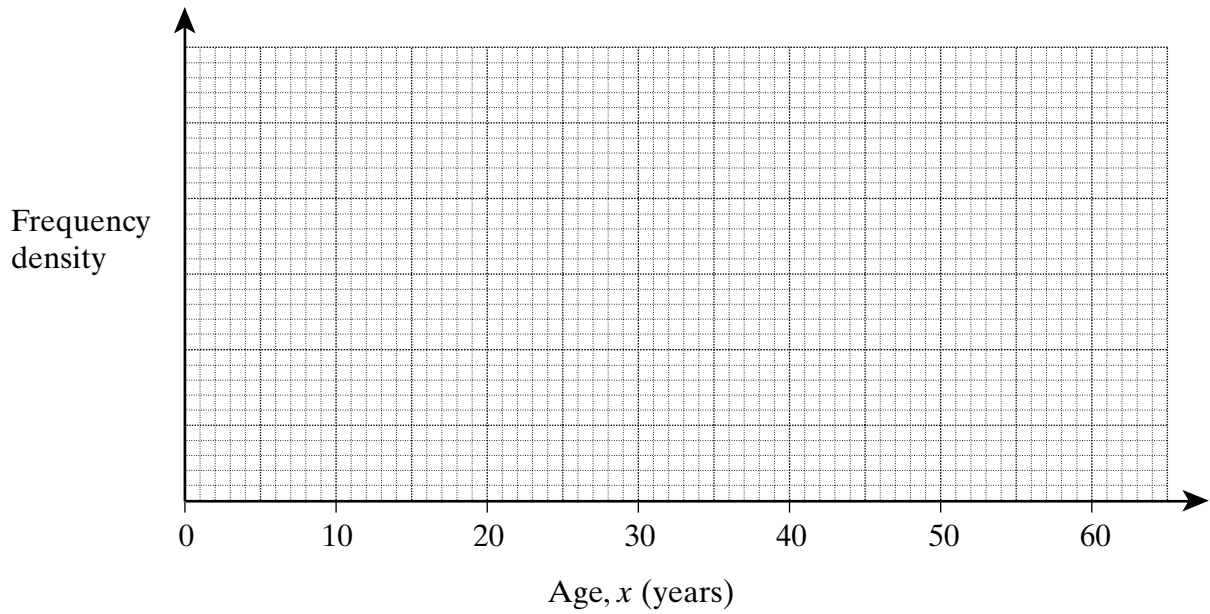
(c) Draw a histogram to represent these ages.

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(3 marks)

(d) Calculate an estimate of the number of workers who are aged under 21.

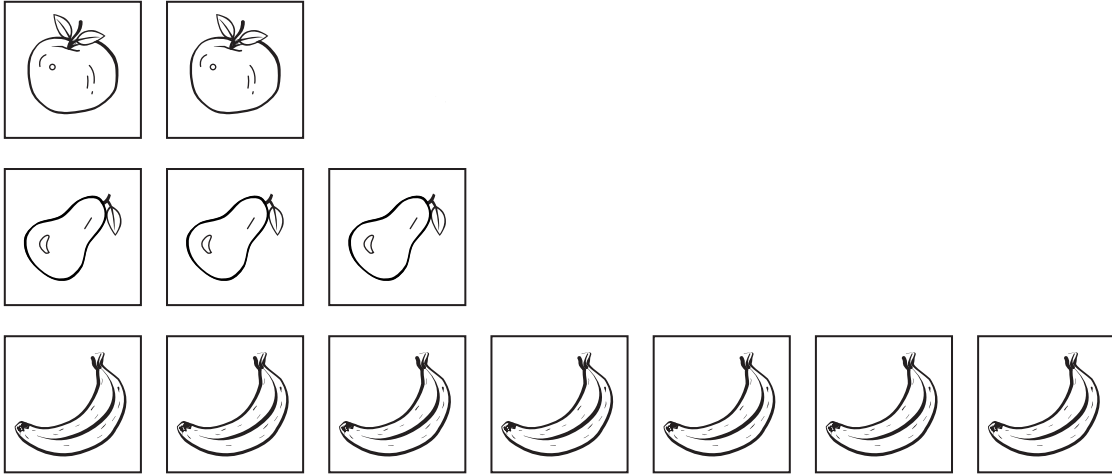
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Answer ..... (2 marks)

- 3 Ingrid has 12 picture cards.  
There are 2 apples, 3 pears and 7 bananas.



Ingrid chooses 2 cards at random.

Calculate the probability that both cards are the same.  
You **must** show your working.

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Answer ..... (5 marks)

**END OF SECTION A**

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General Certificate of Secondary Education  
March 2004




**MATHEMATICS (MODULAR) (SPECIFICATION B)  
Module 1 Higher Tier Section B**

**33001/HB**

**H**

Monday 1 March 2004 9.30 am to 9.55 am

<p><b>In addition to this paper you will require:</b> mathematical instruments.</p> <p>You must <b>not</b> use a calculator.</p>	
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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.

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

- 4 A group of 80 trainee secretaries have their typing speeds tested. The table shows their results in words per minute (wpm).

Speed, $s$ (wpm)	Number of typists
$20 \leq s < 30$	8
$30 \leq s < 40$	30
$40 \leq s < 50$	24
$50 \leq s < 60$	13
$60 \leq s < 70$	5

Speed, $s$ (wpm)	Cumulative frequency
$< 30$	
$< 40$	
$< 50$	
$< 60$	
$< 70$	

- (a) (i) Complete the cumulative frequency column in the table. *(1 mark)*  
 (ii) Draw a cumulative frequency diagram on the grid opposite. *(3 marks)*

- (b) Use your diagram to estimate the interquartile range.

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

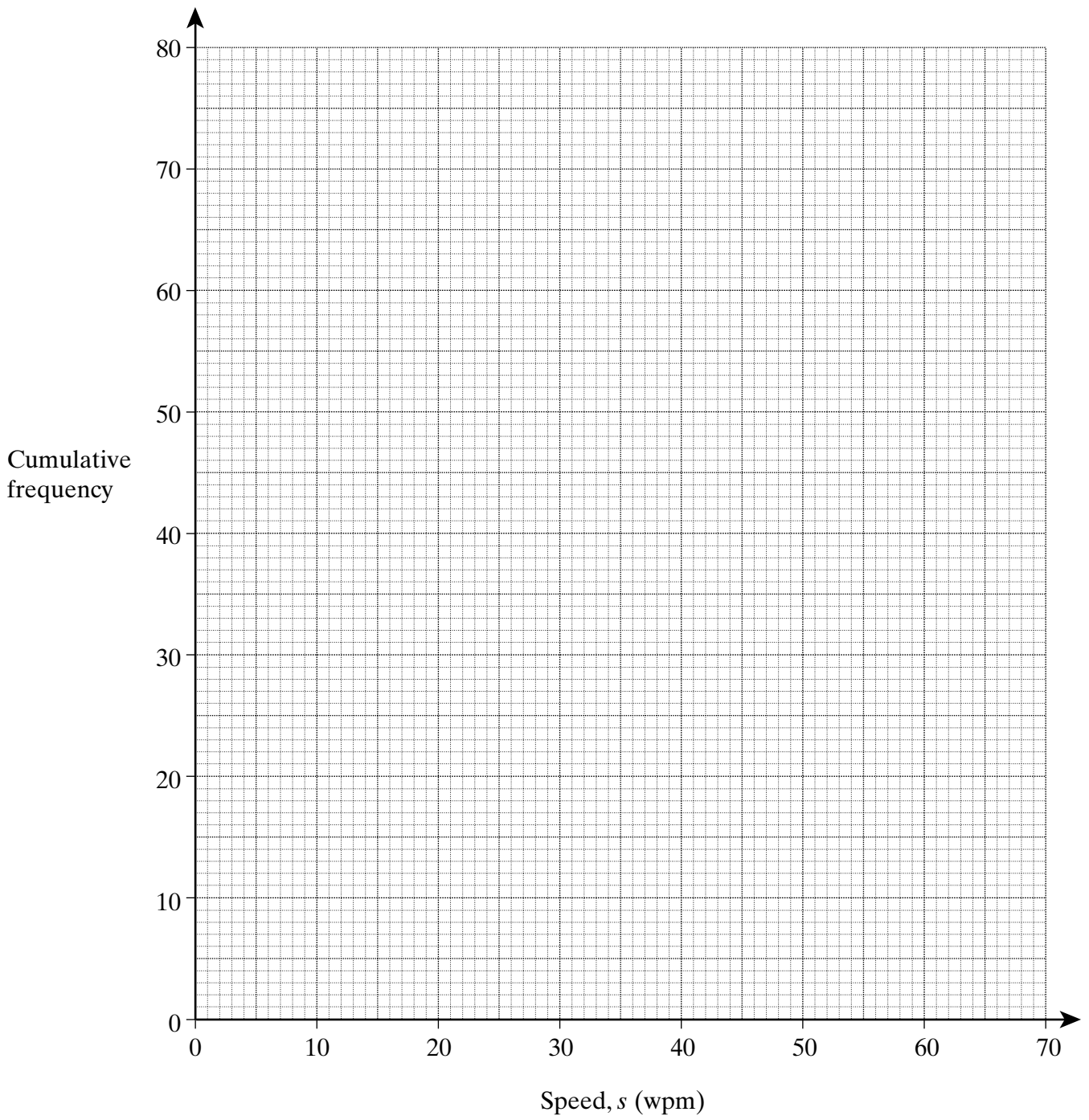
- (c) Typists achieving less than 45 words per minute have to resit the test.

Estimate the number of typists who have to resit the test.

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

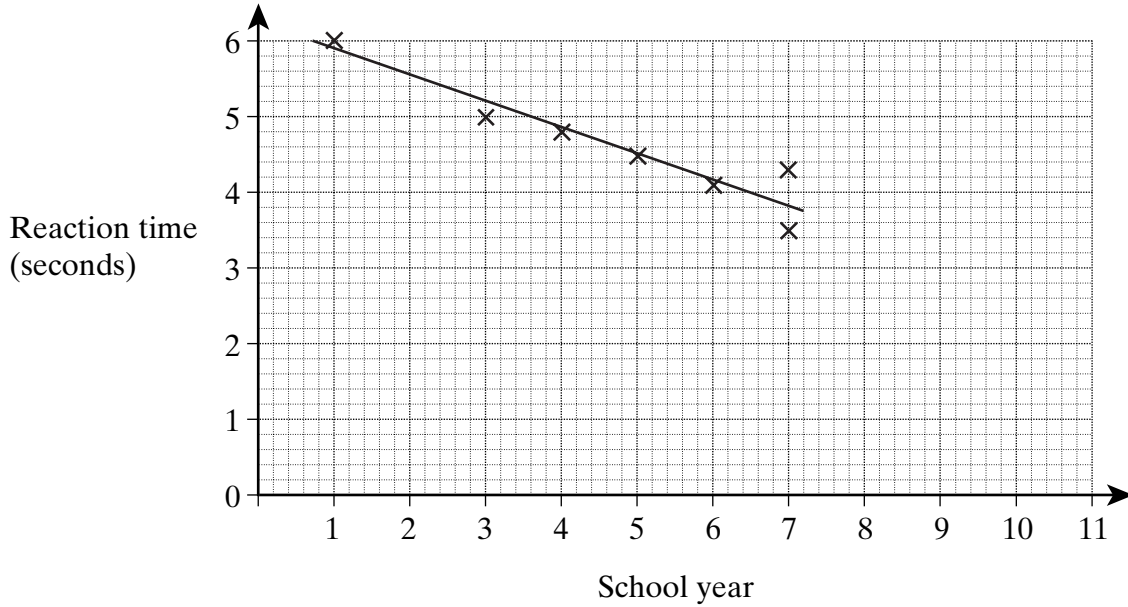




$\frac{7}{7}$

Turn over

- 5 The scatter graph shows the school year and the reaction time of seven people who took part in the same test.  
The line of best fit is shown.



- (a) State the type of correlation shown.

Answer ..... (1 mark)

- (b) Use the line of best fit to estimate the reaction time of a person in school year 2.

Answer ..... seconds (1 mark)

- (c) Explain why it would not be sensible to use the line of best fit to estimate the reaction time of a person in school year 11.

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(1 mark)

- 6 The table shows the numbers of each type of employee at a large store.

Management	Shop assistants	Office staff	Warehouse staff	Security staff
12	67	35	31	15

The owner wishes to choose some employees to form a committee to represent the views of all the employees.

- (a) State **one** advantage of using a sample stratified by type of employee.

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(1 mark)

- (b) The owner wants 16 employees on the committee. He decides to use a sample stratified by type of employee.

Complete the table to show how many of each type of employee he should choose.

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Management	Shop assistants	Office staff	Warehouse staff	Security staff

(4 marks)

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Turn over ►

7 Some students decide to organise a day out.  
They can only go on a Saturday or a Sunday.

$\frac{7}{12}$  of students choose a theme park.

The rest choose a water park.

$\frac{5}{7}$  of those choosing the theme park prefer Saturday.

$\frac{8}{15}$  of those choosing the water park prefer Sunday.

(a) One person is chosen at random.

Calculate the probability that this person prefers Saturday.

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Answer ..... (3 marks)

(b) Of the students, 88 prefer Saturday.

How many students are there altogether?

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Answer ..... (2 marks)

**END OF QUESTIONS**

