OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

B278/A

MATHEMATICS C

MODULE M8 – SECTION A

SPECIMEN

Candidates answer on the question paper.

Additional Materials:
Geometrical instruments
Tracing paper (optional)

Time: 30 minutes

Candidate Name	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this section is 25.

WARNING You are not allowed to use a calculator in this paper.

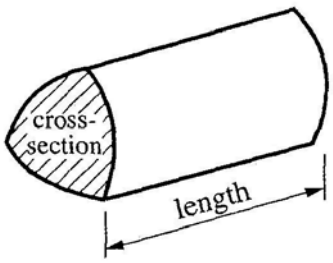
For Examiner's Use	
Section A	

This document consists of **8** printed pages.

[Turn over

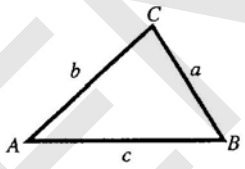
FORMULAE SHEET

Volume of prism = (area of cross-section) x length



In any triangle *ABC*

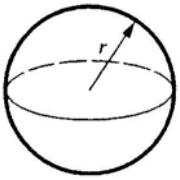
Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

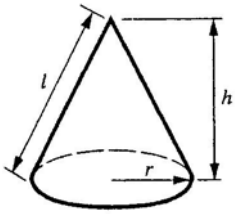
Area of triangle $= \frac{1}{2}ab\sin C$

Volume of sphere $\frac{4}{3}\pi r^3$



Surface area of sphere $= 4\pi r^2$

Volume of cone $= \frac{1}{3}\pi r^2 h$



Curved surface area of cone $= \pi rl$

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

1 **(a)** Simplify, giving your answer as a power of 10.

(i) $10^5 \times 10^4$

(a)(i) _____ [1]

(ii) $10^8 \div 10^2$

(ii) _____ [1]

(b) Write $3{\cdot}45 \times 10^4$ as an ordinary number.

(b) _____ [1]

3

2 Calculate.

$3\frac{2}{3}+1\frac{1}{4}$

_____ [2]

2

[Turn over

3 **(a)** Multiply out and simplify.

$$(x+4)(x-7)$$

(a) _____ [2]

(b) Factorise.

$$4ab-2ac$$

(b) _____ [2]

(c) Rearrange this formula to make x the subject.

$$4(x-y)=3y+2$$

(c) _____ [3]

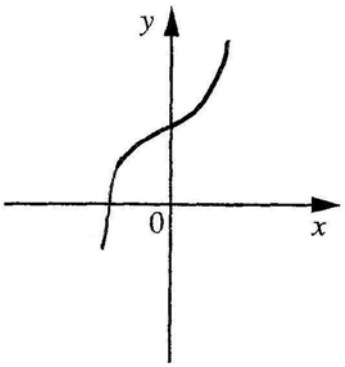
7

[Turn over

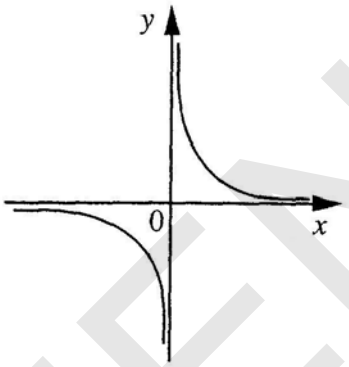
4 For each of the sketch graphs below, choose the correct equation from this list.

$y = 2 - x^3$ $\quad$ $y = \dfrac{-2}{x}$ $\quad$ $y = 2 + x^3$ $\quad$ $y = \dfrac{2}{x}$

(a)



(b)



(a) _____ (b) _____ [2]

2

5 In these expressions *a* and *b* are lengths.

$\pi a^2 b$ $\quad$ $2\pi a + \pi b$ $\quad$ πa^2 $\quad$ $2\pi ab$ $\quad$ $a^3 + \pi ab$

Which one of these expressions could represent a volume?

Explain how you decide.

_____ because _____

_____

_____ [2]

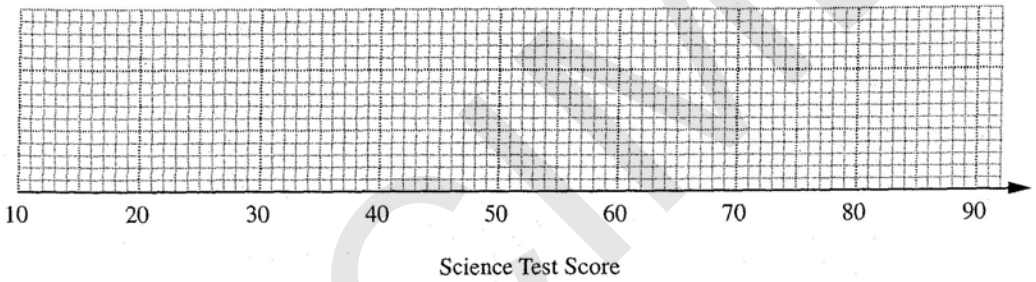
2

[Turn over

6 The scores in a science test are summarised in the table below.

Minimum mark	19
Range	60
Median	60
Lower quartile	42
Interquartile range	28

(a) Use this information to draw a box plot. [3]



(b) Complete this statement.

……% of students scored below 42. [1]

4

7 Sports activities are held after school.

Zaneekia attends these classes on Monday and Wednesday.

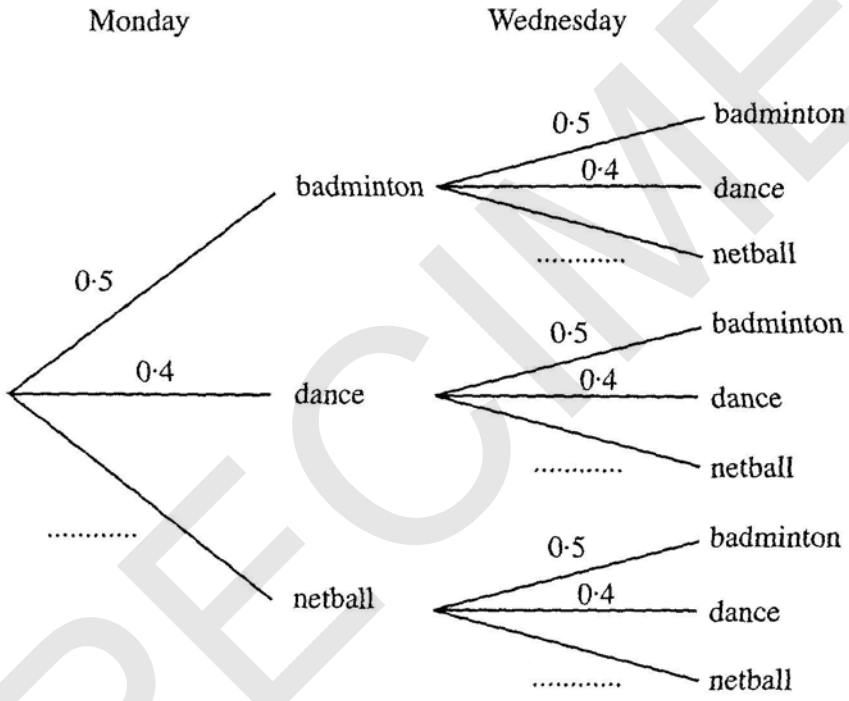
She can choose one of badminton, dance or netball on each day.

The probability she chooses badminton is 0·5.

The probability she chooses dance is 0·4.

Assume Zaneekia's choices are independent.

(a) Complete the tree diagram below.



[1]

(b) What is the probability that Zaneekia will choose the same sports activity on **both** days?

(b) _____ [4]

Section A Total [25]

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS C B278/A

MODULE M8 – SECTION A

Specimen Mark Scheme

The maximum mark for this paper is 25.

This document consists of **4** printed pages.

1	**a)**	**i)** 10^9	**1**			
		ii) 10^6	**1**			
	b)	34 500	**1**			
			3			
2		4 11/12	**2**		**M1**	8/12 or 3/12
			2			
3	**a)**	x^2 - 3x -28	**2**		**M1**	x^2 + 4x- 7x –28 two terms correct
	b)	2a(2b – c)	**2**		**M1**	a(4b – 2c) or 2(2ab – ac) or 2a(2b + c)
	c)	(x)=(7y+2)/4 or $\frac{4y + 3y + 2}{4}$ or (3y+2)/4 + y	**3**		**M1**	4x – 4y = 3y + 2 or and
					M1	ft 4x = 4y + 3y + 2 or
					M2	x – y = (3y+2)/4
			7			
4	**a)**	$y = 2 + x^3$	**1**			
	b)	$y = \frac{2}{x}$	**1**			
			2			
5		$\pi a^2 b$	**1**			
		$L^2 \times L$, $L \times L \times L$ (dep)	**1**			
			2			
6	**a)**	min at 19 and max at 79	**1**		**M1**	If no diagram SC1 for max and UQ listed
		LQ at 42 and UQ at 70	**1**		**M1**	
		complete diagram with median at 60	**1**		**M1**	
	b)	25%	**1**		**M1**	
			4			

7		0.1 on all branches 0.42 o.e.	**1** **4** **5**		**M1** **M1** **M1**	0.5^2 or 0.4^2 or 0.1^2 seen and three branches identified, indept. $0.5^2 + 0.4^2 + 0.1^2$ or 0.25 + 0.16 + 0.01 SC3 for 0·51 (from use of $0{\cdot}1^2$ = 0·1)

Section A Total 25

Question	AO2	AO3	AO4	Total
1	3	0	0	**3**
2	2	0	0	**2**
3	7	0	0	**7**
4	2	0	0	**2**
5	0	2	0	**2**
6	0	0	4	**4**
7	0	0	5	**5**
Totals	**14**	**2**	**9**	**25**