OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

B279/B

MATHEMATICS C

MODULE M9 – SECTION B

SPECIMEN

Candidates answer on the question paper.

Time: 30 minutes

Additional Materials:
Geometrical instruments
Tracing paper (optional)
Scientific or graphical calculator

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

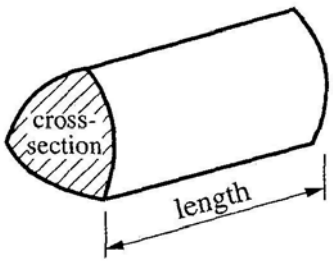
- You are expected to use a calculator in Section B of this paper.
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this section is 25.
- Section B starts with Question 6.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.

For Examiner's Use	
Section B	

This document consists of **9** printed pages and **3** blank pages.

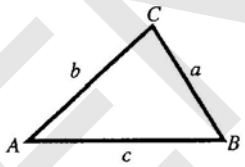
FORMULAE SHEET

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



In any triangle *ABC*

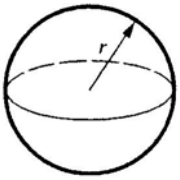
Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



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

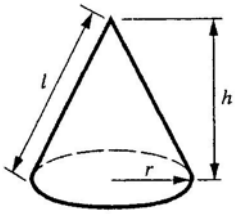
Area of triangle $= \frac{1}{2}ab\sin C$

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

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

6 The population of India in July 2002 was $1{\cdot}05 \times 10^9$.

The population of Bahrain in July 2002 was $6{\cdot}56 \times 10^5$.

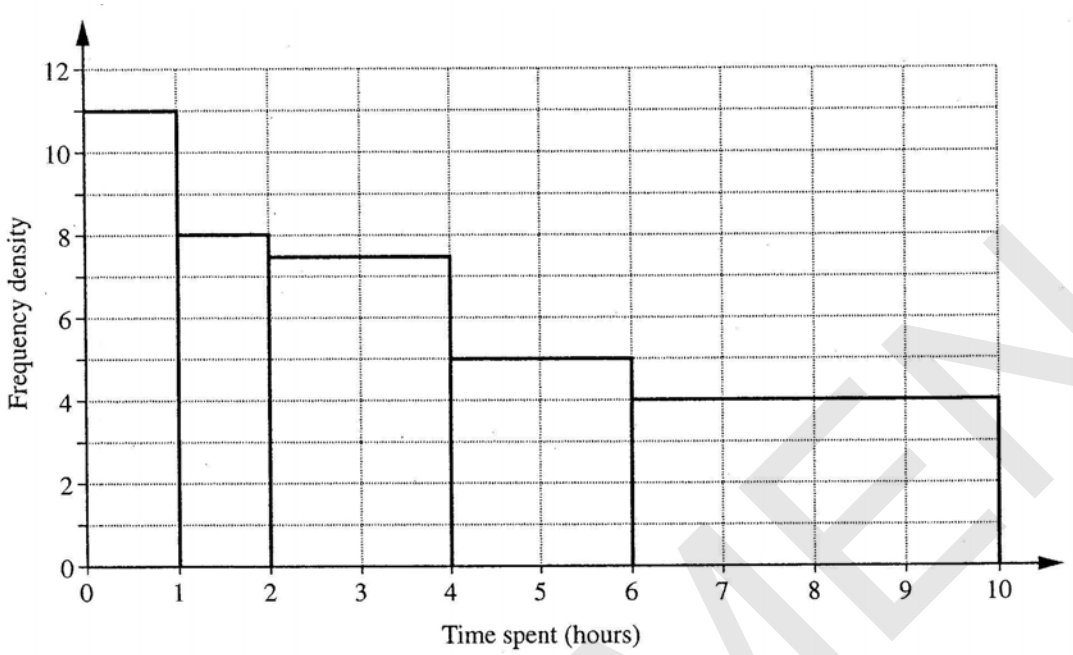
How many times larger than the population of Bahrain was the population of India?

[2]

2

[Turn over

7 This histogram shows the distribution of times that a group of people spent using the internet one day.



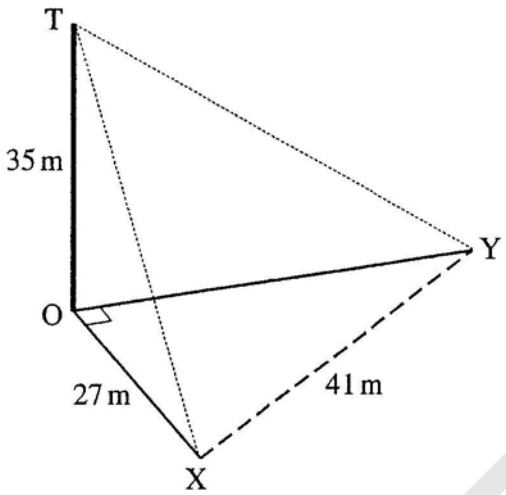
10 of the people spent between 4 and 6 hours using the internet.

Find how many people were in the group altogether.
Show your method clearly.

[3]

3

8



TO is a vertical radio mast of height 35 m.
X, Y and O are on horizontal ground.
X is 27 m due south of the foot, O, of the mast.
Y is due east of O.
Y is 41 m from X.

(a) Calculate the distance YO.

(a) _____ m [3]

(b) Calculate the angle of elevation of T from X.

(b) _____ ° [3]

6

[Turn over

9 The equation of a straight line **P** is $y = 2x + 1$.

(a) Which of these lines are parallel to **P**?

Give a reason for your answer.

Q $y = 3x + 1$	**R** $3y = 6x + 5$	**S** $4y = 2x + 1$
B $y = \frac{1}{2}x + 4$	**U** $y = 2x + 4$	**V** $y = -2x + 1$

_____ and _____ because _____

_____ [2]

(b) A straight line **W** is perpendicular to line **P** and passes through (0,3).

Find the equation of line **W**.

(b) _____ [2]

4

10 **(a)** The cost, £C, of painting a fence is directly proportional to its length, L metres.

It costs £19·80 to paint a fence of length 6 m.

(i) Find the equation for C in terms of L.

(a)(i) _____ [2]

(ii) What length of fence can be painted for £49·50?

(ii) _____ m [1]

(b) A rectangular fence is 3·4 m wide and 1·8 m high.
Both these measurements are given correct to the nearest 0·1 m.

Calculate the upper bound of the area of one side of this fence.

(b) _____ m^2 [2]

5

[Turn over

11

TOSS THREE COINS
AND SEE IF YOU GET THREE HEADS
TO WIN A PRIZE!

(a) Alan has one attempt to win a prize by tossing three coins to get three heads.

What is the probability that he wins a prize?
Write your answer as a fraction.

(a) _____ [2]

(b) Jane decides to have three attempts to win a prize.

Work out the probability that she loses on her first two attempts and **then** wins on her last attempt. Write your answer as a fraction.

(b) _____ [3]

5

Section B Total 25

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OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

MATHEMATICS C B278/B

MODULE M8 – SECTION B

Specimen Mark Scheme

The maximum mark for this section is 25.

This document consists of **3** printed pages and **1** blank page.

6		1600.(...) o.e. in stand. form	**2** **2**		**M1**	for $(1.05 \times 10^9)/(6.56 \times 10^5)$
7		11 + 8 + 15 + 10 + 16 = 60	**M2** **B1** **3**			o.e. eg 15 may be split 7.5 + 7.5; **M1** if one error
8	**a)**	30.85.. r.o.t. to 3 or more sf; allow 31 if method seen	**3**		**M1**	for $41^2 - 27^2$ and **M1** for taking square root of sum or difference of squares
	b)	52.35.. .. r.o.t. to 3 or more sf; allow 52 if method seen	**3** **6**		**M1**	for tan x = 35/27 and **M1** for inverse their trig fn seen or used
9	**a)**	R and U gradient 2	**1** **1**			
	b)	y = -0.5x + 3	**2** **4**		**M1**	gradient –0.5
10	**a)**	C = 3.3L	**2**			condone £ signs; M1 for $C = kL$ 1 for unsimplified ans or C omitted or L = C/3.3 or (k=)3.3 seen
	b)	15 or ft their equation	**1**			
	c)	6.3825 rot to 4 or more sf	**2** **5**		**M1**	for 3.45 or 1.85 seen [condone 3.4499 or better] or for a different answer in range 6.381 to 6.3825
11	**a)**	1/8	**2**		**M1**	for $(1/2)^3$ s.o.i.
	b)	49/512	**3** **5**		**M2**	for (1 – their (a))^2 × their (a) or **M1** for 1 – their (a) used (must **clearly** be from their (a))

Section B Total 25

Assessment Objectives Grid

Question	AO2	AO3	AO4	Total
6	2	0	0	**2**
7	0	0	3	**3**
8	0	6	0	**6**
9	4	0	0	**4**
10	5	0	0	**5**
11	0	0	5	**5**
Totals	**11**	**6**	**8**	**25**

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