OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

B279/A

MATHEMATICS C

MODULE M9 – 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.

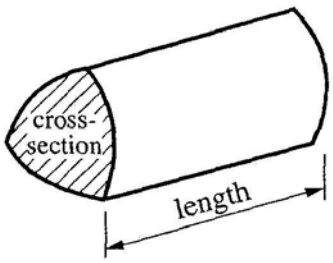
For Examiner's Use	
Section A	

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

  [Turn over

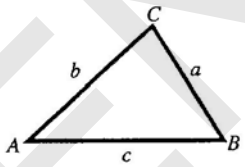
FORMULAE SHEET

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



In any triangle *ABC*

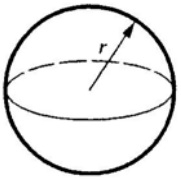
Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



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

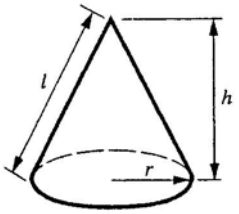
Area of triangle $= \frac{1}{2}ab\sin C$

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 Evaluate.

(a) 5^0

(a) _____ [1]

(b) 4^{-2}

(b) _____ [1]

(c) $64^{\frac{1}{3}}$

(c) _____ [1]

3

[Turn over

2 This table shows the distribution of pupils in a school.

	Y7	Y8	Y9	Y10	Y11	Total
Boys	68	62	54	54	32	270
Girls	62	58	36	36	38	230
Total	130	120	90	90	70	500

A survey is being conducted amongst the pupils of the school.
It is decided to select a sample of 10% of the pupils.

(a) The organiser suggests choosing the 50 pupils for the survey by selecting 5 boys and 5 girls from each year group.

Explain why this is not a representative sample of the pupils in the school.

.....

..... [1]

(b) Describe a method of selecting a more representative sample.

You should use the figures from the table for one year group to help you explain your method.

.....

.....

.....

..... [2]

3

3 **(a)** Factorise.

$x^2 - 7x + 6$

(a) _____ [2]

(b) Hence simplify.

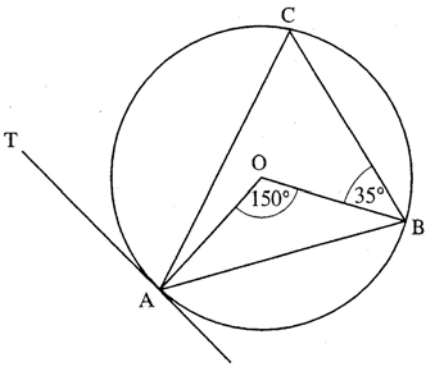
$$\frac{x^2 - 7x + 6}{x^2 - 36}$$

(b) _____ [3]

5

[Turn over

4



Not to scale

A, B and C are points on the circumference of a circle with centre O.
TA is a tangent to the circle.
Angle AOB = 150° and angle CBO = 35°.

(a) **(i)** Find angle ACB.
Give a reason for your answer.

Angle ACB = _____ ° because .....

..... [2]

(ii) Find angle TAC.
Give reasons for your answer.

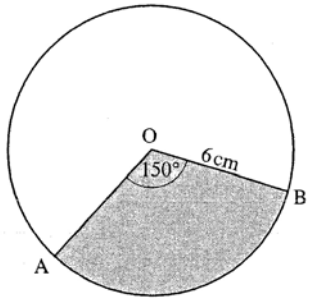
Angle TAC = _____ ° because .....

.....

..... [3]

(b) The radius of the circle is 6 cm.

Work out the area of the shaded sector AOB.
Express your answer as simply as possible in the form $k\pi$ cm^2.



Not to scale

(b) _____ cm^2 [3]

8

5 **(a)** Make *r* the subject of this formula.

$$V = \frac{1}{3}\pi r^2 h$$

(a) _____ [3]

(b) Make *v* the subject of this formula.

$$u + v = uvf$$

(b) _____ [3]

6

Section A Total 25

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS C B279/A

MODULE M9 – SECTION A

Specimen Mark Scheme

The maximum mark for this paper is 25.

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

1	**a)**	1	**1**			
	b)	1/16 or 0.0625	**1**			
	c)	4	**1**			
			3			
2	**a)**	explanation e.g. unequal number of pupils across year gps or unequal numbers of boys and girls in some years	**1**			
	b)	e.g. Y7 boys $\frac{68}{500} \times 50$ and Y7 girls $\frac{62}{500} \times 50$.	**1**		**M1**	
		7 boys and 6 girls.	**1**		**A1**	
			3			
3	**a)**	$(x - 6)(x - 1)$	**2**		**M1**	for sign error $(x \pm 6)(x \pm 1)$ or for $(x - 2)(x - 3)$
	b)	$(x - 1)/(x + 6)$	**3**		**M1**	for $x^2 - 36 = (x + 6)(x - 6)$ seen and **M1** for correct cancelling seen ft for **A1** if $(x - 6)$ or $(x + 6)$ factor of (a)
			5			
4	**a)**	**i)** 75	**1**			
		angle at centre = $2 \times$ angle at circumference	**1**			at least one of centre and circumference must be mentioned or any other **complete explanation.**
		ii) 50	**2**			1 for angle ABO = 15° [may be on diagram]
		[angle in isos triangle +] alt seg	**1**			or any other **complete explanation.**
	b)	15π	**3**		**M2**	for $150/360 \times \pi \times 6^2$ or **M1** for 150/360 of circle
			8			

5	**a)**	$r = \sqrt{\frac{3V}{\pi h}}$	**3**		**M1** **M1** **M1** **SC2**	**W2** if *r* omitted or for triple-decker equiv. **or** for dealing with 3 correctly [M0 for triple-decker] for dealing with πh correctly for square root of their $r^2 = k$ for $r^2 = \frac{3V}{\pi h}$
	b)	$v = \frac{u}{uf - 1}$ or $\frac{-u}{1 - uf}$	**3** **6**			**W2** if *v* omitted or **M1** for $u = uvf - v$ or $v - uvf = -u$ **and M1** for $u = v(uf - 1)$ oe. Condone one sign error for 2nd **M**

Section A Total 25

Question	AO2	AO3	AO4	Total
1	3	0	0	**3**
2	0	0	3	**3**
3	5	0	0	**5**
4	0	8	0	**8**
5	6	0	0	**6**
Totals	**14**	**8**	**3**	**25**