OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS C
(Graduated Assessment)

1966/2340B

MODULE M10 – SECTION B

Wednesday **28 JUNE 2006** Morning 30 minutes

Candidates answer on the question paper.
Additional materials:
Geometrical instruments
Tracing paper (optional)
Scientific or graphical calculator

Candidate Name	

Centre Number						Candidate Number				

TIME 30 minutes

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 7.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.

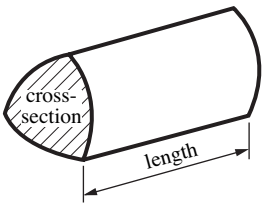
FOR EXAMINER'S USE	
Section B	

This question paper consists of 8 printed pages.

[Turn over

Formulae Sheet

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

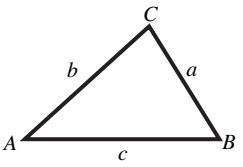


In any triangle *ABC*

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

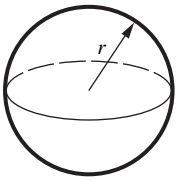
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



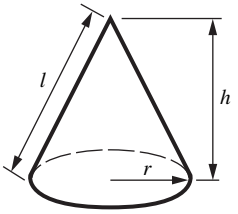
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = $\pi r l$



The Quadratic Equation

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

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

PLEASE DO NOT WRITE ON THIS PAGE

7 The population of bacteria present in a colony is increasing.
After t hours the population is given by

$$p = 2000 \times 1{\cdot}3^t.$$

(a) How many bacteria were present when $t = 0$?

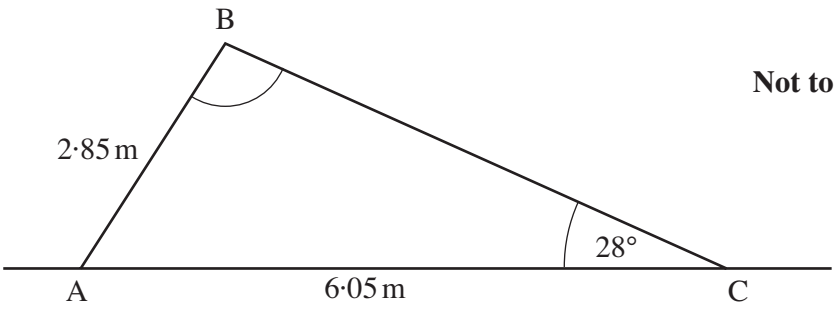
(a) .....[1]

(b) How many bacteria were present after 12 hours?

(b) .....[2]

3

8 ABC represents a children's slide.



Not to scale

The angle between the steps, AB, and the slide, BC, is obtuse.

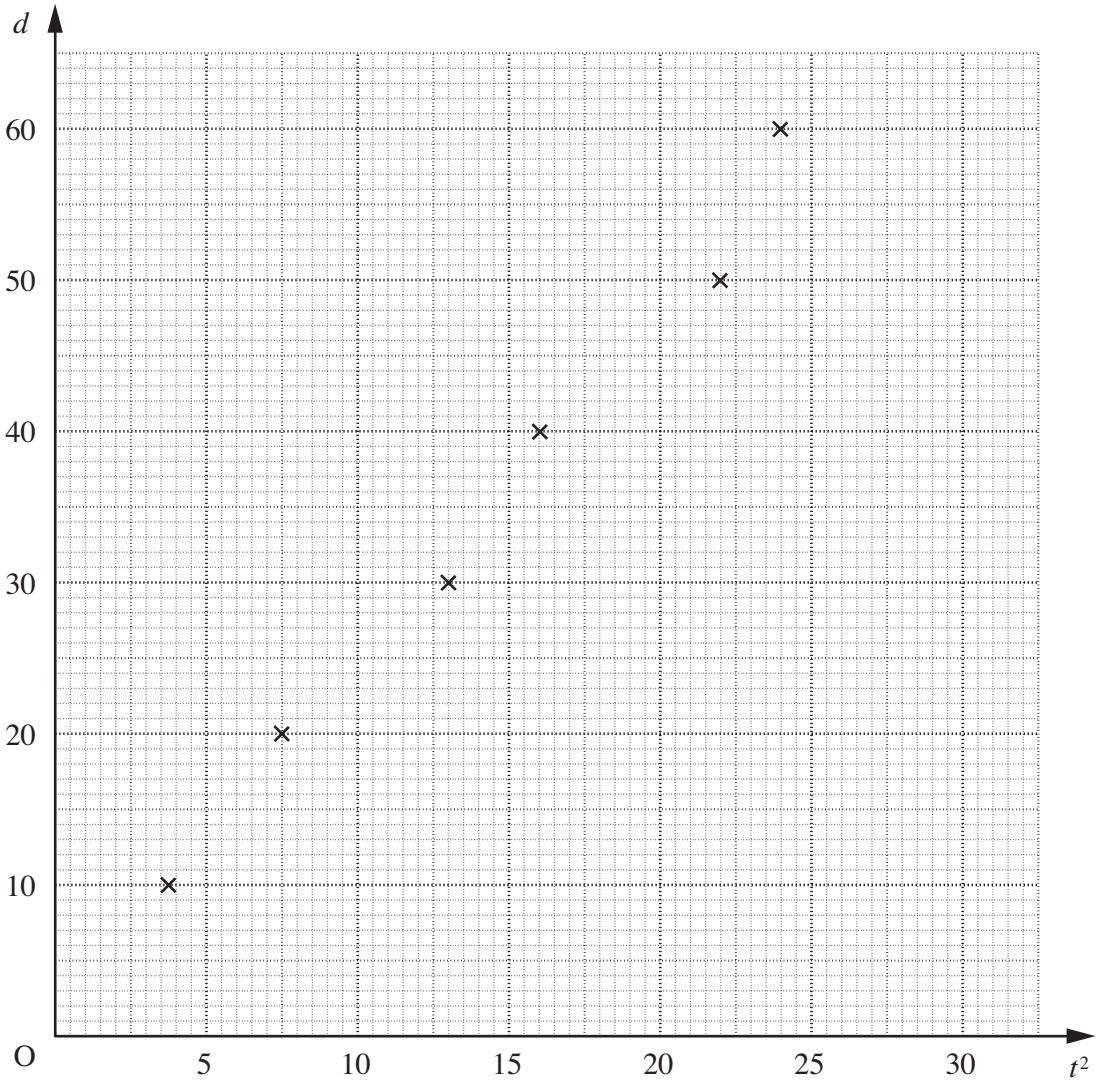
Show, by calculation, that this angle is 95°, to the nearest degree.

[4]

4

9 A driver accelerated a car from a standing start.
The times, t seconds, taken to travel different distances, d metres, were recorded.

It is known that d and t are connected by the equation $d = kt^2$.
The values of d against t^2 are plotted on this grid.

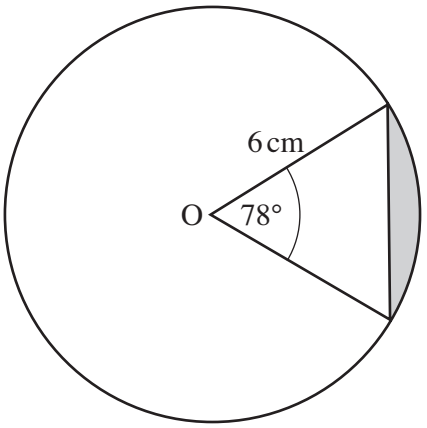


Find an approximate value for k.

.....[2]

2

10 The diagram shows a circle with centre O and radius 6 cm.



Not to scale

Find the area of the shaded segment.
Give the units of your answer.

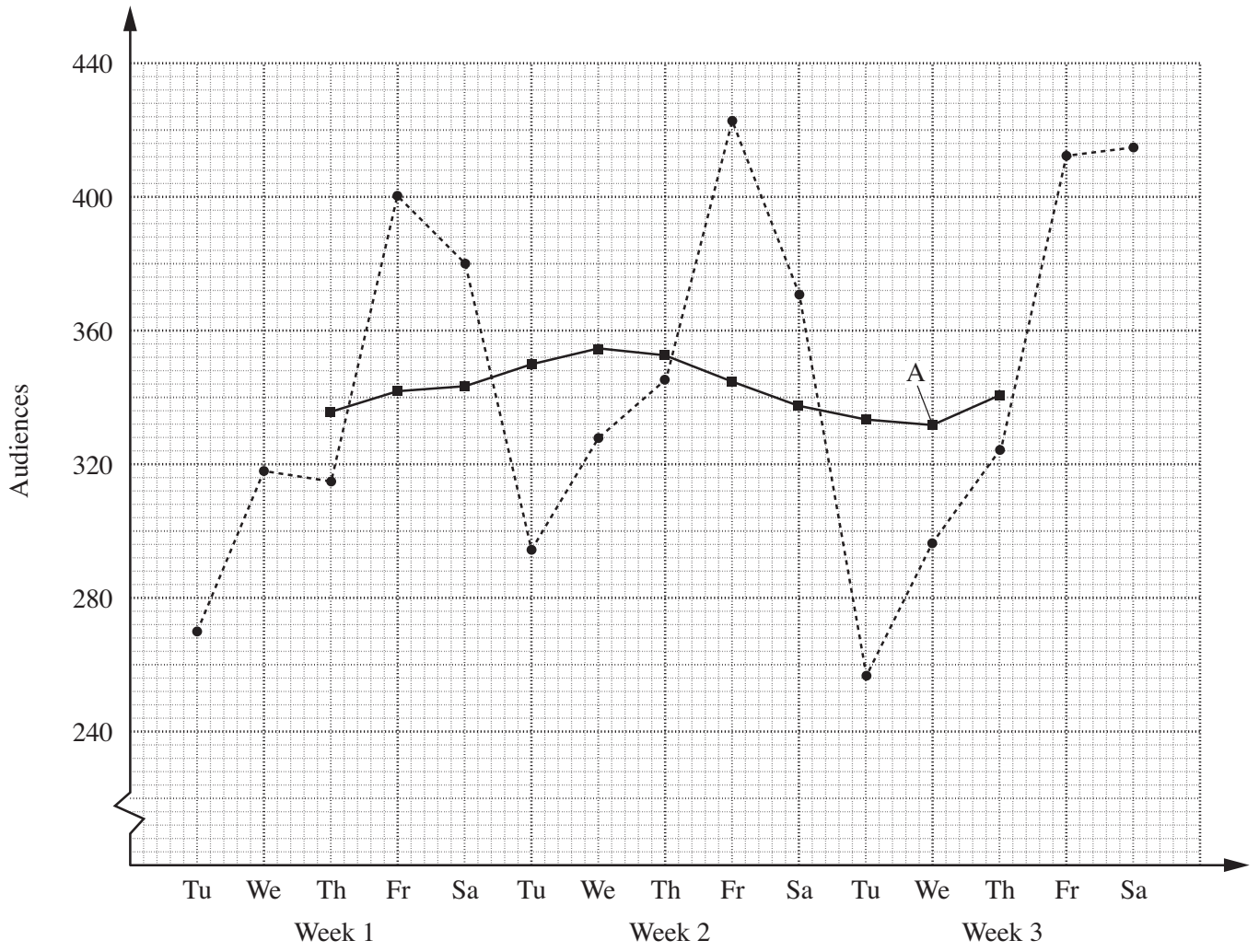
.....[6]

6

11 This table shows the audiences for a 3-week run of a play at a theatre.

	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1	270	318	315	400	380
Week 2	294	328	345	423	371
Week 3	257	296	324	412	415

These data have been plotted on the grid along with the 5-day moving averages.



(a) One of the moving averages has been marked A.

Show how this point has been calculated.

[1]

(b) Comment on the daily variation.

.....

.....

.....[1]

(c) Describe what the moving averages show about the audiences during the 3-week run.

.....

.....

.....[1]

3

TURN OVER FOR QUESTION 12

12 Solve, algebraically, these simultaneous equations.
Give your answers correct to one decimal place.

$x^2 + y^2 = 93$

$y = x + 2$

x = ... y = ...

x = ... y = ...[7]

7