OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS C
(Graduated Assessment)

1966/2340A

MODULE M10 – SECTION A

Wednesday **29 JUNE 2005** Morning 30 minutes

Candidates answer on the question paper.
Additional materials:
Geometrical instruments

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.
- Write your answers on the dotted lines unless the question says otherwise.
- 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.
- There is a space after most questions. Use it to do your working. 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 in the grey area between the pages.
- **DO NOT** WRITE IN THE AREA **OUTSIDE** THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA 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 Section A of this paper.

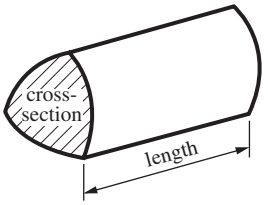
FOR EXAMINER'S USE	
Section A	
Section B	
TOTAL	

This question paper consists of 7 printed pages and 1 blank page.

[Turn over

Formulae Sheet

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

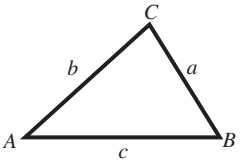


In any triangle *ABC*

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

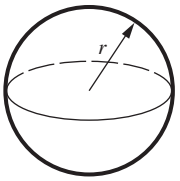
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



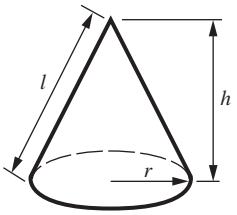
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

1 **(a)** Change $0\dot{2}0\dot{7}$ into a fraction in its simplest form.

(a) .....[3]

(b) Express $\frac{10}{\sqrt{5}}$ in the form $a\sqrt{b}$, where a and b are integers.

(b) .....[2]

5

2 The expression $x^2 - 4x - 21$ can be written in the form $(x - a)^2 - b$.

(a) Find the values of a and b.

(a) a = ...

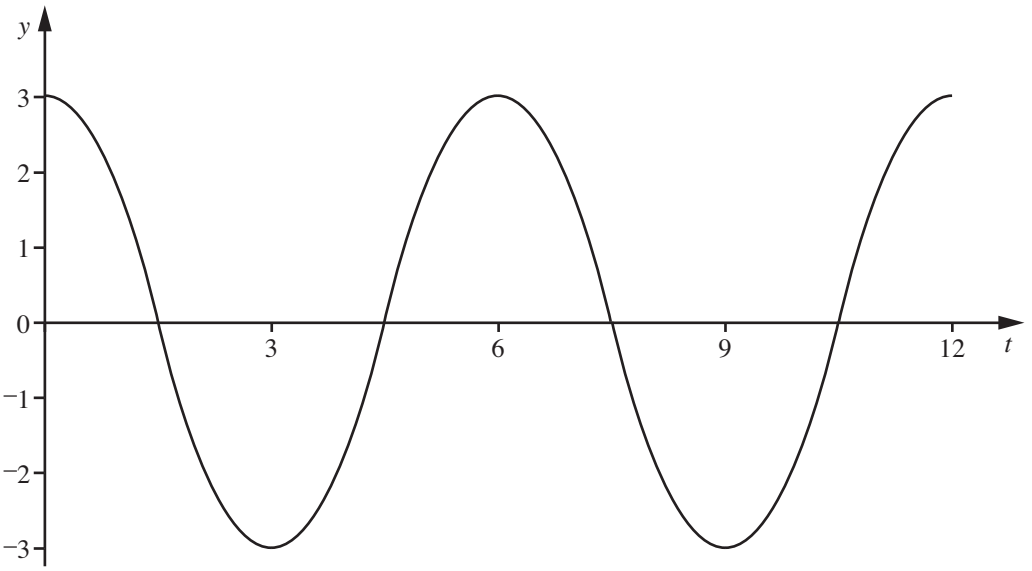
b = ...[3]

(b) Hence find the minimum value of the expression and the value of x at which it occurs.

(b) minimum value..... when x =..... [2]

5

3



Give three reasons to justify that $y = 3\cos(60t)°$ is the equation of the curve shown above.

1. .....

.....

2. .....

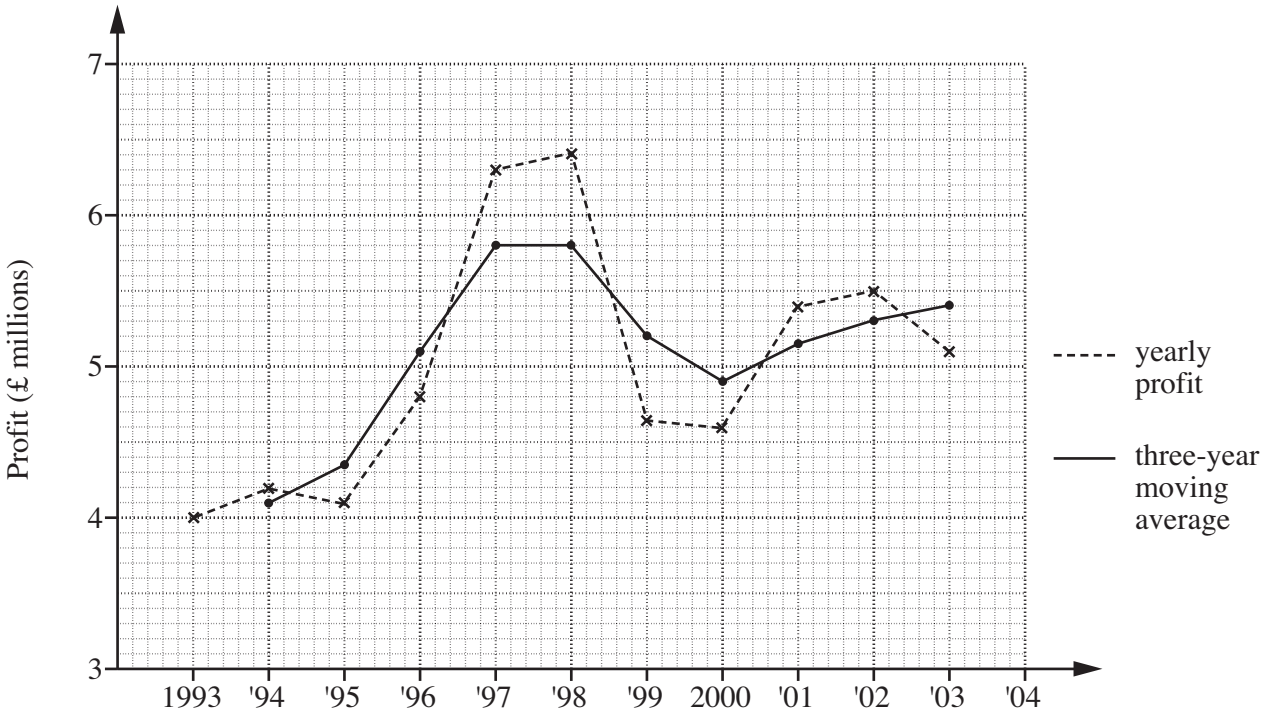
.....

3. .....

.....[3]

3

4 This graph shows the yearly profits for a firm and the three-year moving averages.



(a) Use the graph of the three-year moving averages to describe the trend in yearly profits.

.....

.....[1]

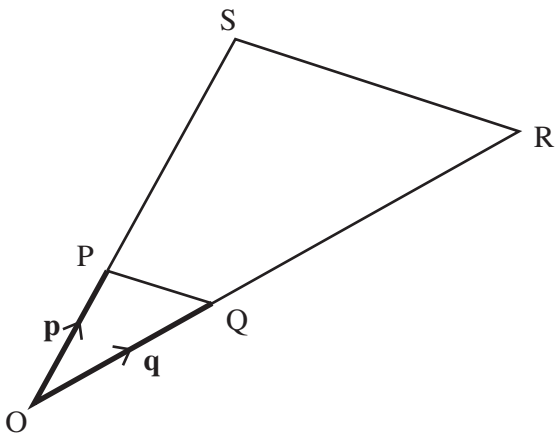
(b) The yearly profit for 2004 has been omitted.

Use the graph to help you calculate the yearly profit for 2004.
Show your method clearly.

(b) £.....million [2]

3

5



Not to scale

In the diagram OQR and OPS are straight lines.

$\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OQ} = \mathbf{q}$.

OP : OS = 1 : 4 and OQ : OR = 1 : 4.

(a) Work out, in terms of **p** and **q**,

(i) $\overrightarrow{PQ}$,

(a)(i) .....[1]

(ii) $\overrightarrow{SR}$.

(ii) .....[1]

(b) Prove that triangles OQP and ORS are similar.

.....

.....

.....

.....

.....[2]

4

6 Solve algebraically.

$$\frac{2x}{2x-5} - \frac{1}{x-4} = 1$$

.....[5]

5

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