OCR

RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

MATHEMATICS C
(Graduated Assessment)

1966/2340A

MODULE M10 – SECTION A

Wednesday **28 JUNE 2006** Morning 30 minutes

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

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

- 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.

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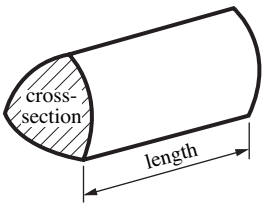
Formulae Sheet

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

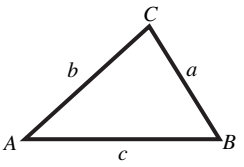


In any triangle *ABC*

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

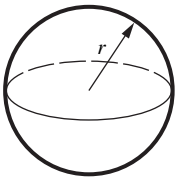
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



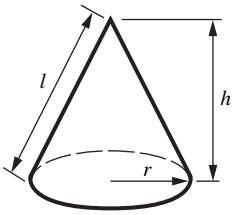
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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1 **(a)** Write $0\dot{2}\dot{4}$ as a fraction in its lowest terms.

(a) .....[3]

(b) Simplify $\left(5-\sqrt{3}\right)^2$.

Write your answer in the form $a-b\sqrt{3}$ where a and b are integers.

(b) .....[2]

5

2 **(a)** Factorise.

$$2x^2 + 9x - 5$$

(a) .....[2]

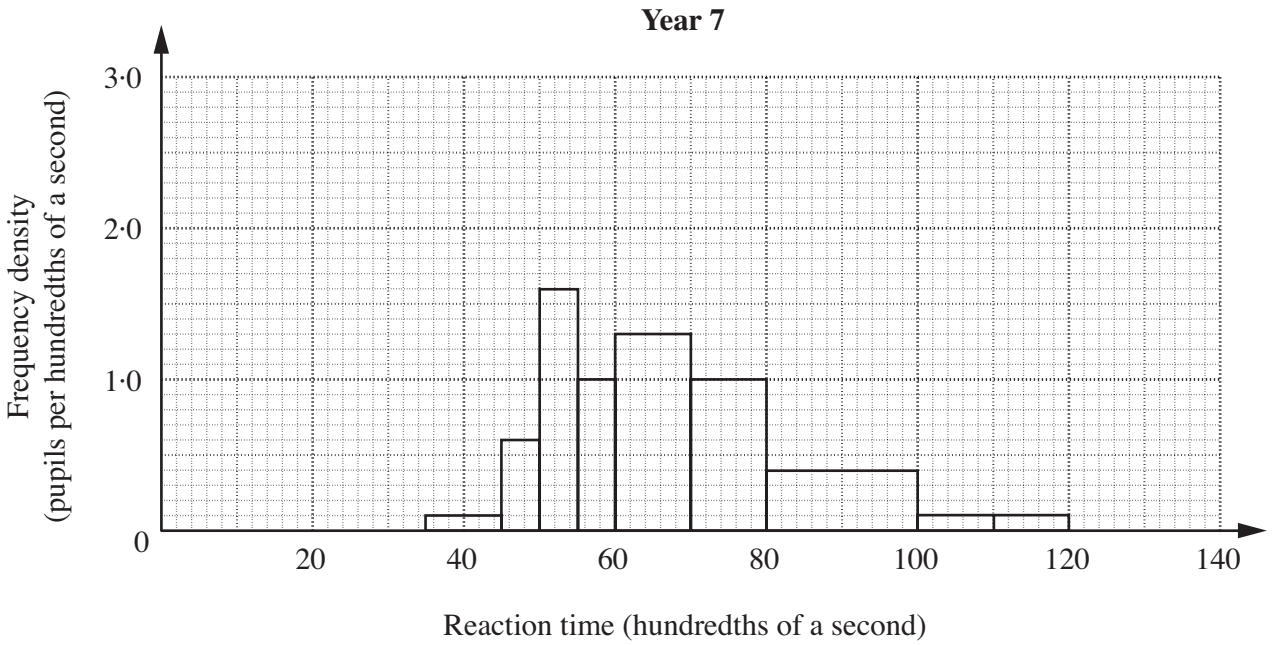
(b) Hence simplify.

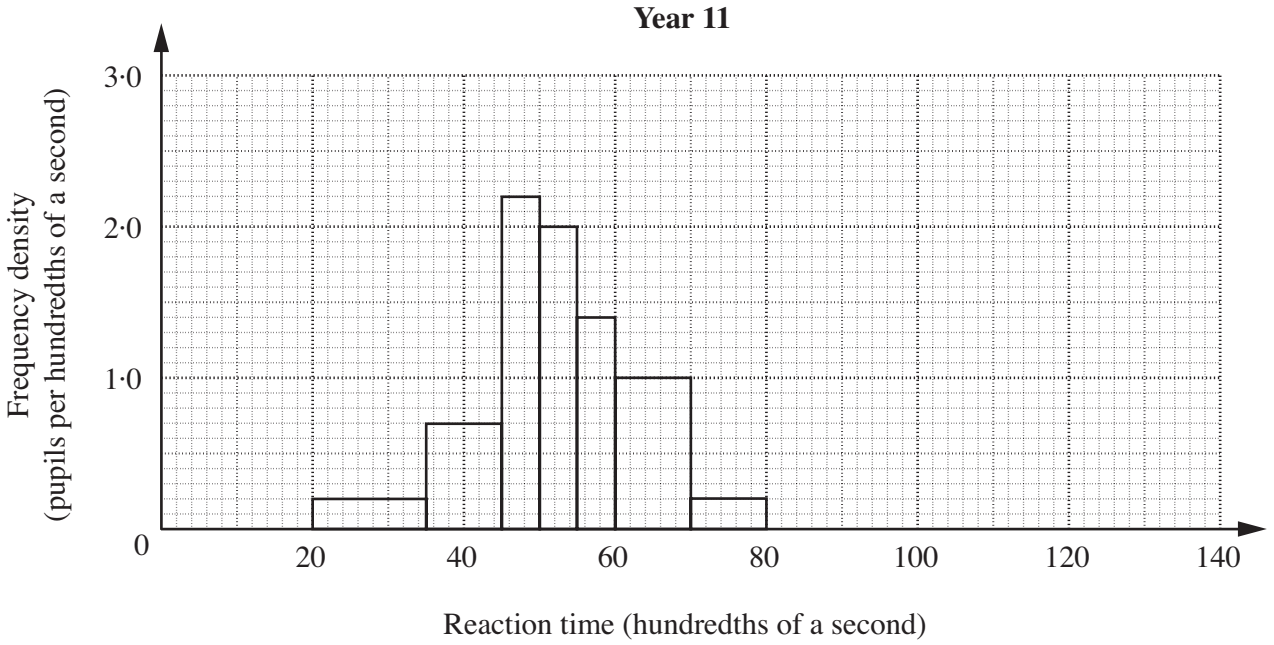
$$\frac{x^2 - 25}{2x^2 + 9x - 5}$$

(b) .....[2]

4

3 **(a)** Teresa measures the reaction times of some pupils in Year 7 and Year 11.
These histograms show the distributions of her results.





Make two comments comparing the reaction times of the pupils in Year 7 and Year 11.

1. .....

.....

2. .....

.....[2]

(b) There are 108 boys and 92 girls in Year 8.

Describe a method of selecting a representative sample of 25% of the Year 8 pupils.

.....

.....

.....

.....

.....

.....[2]

4

4 **(a)** Write $x^2 + 6x - 6$ in the form $(x + a)^2 + b$.

(a) .....[3]

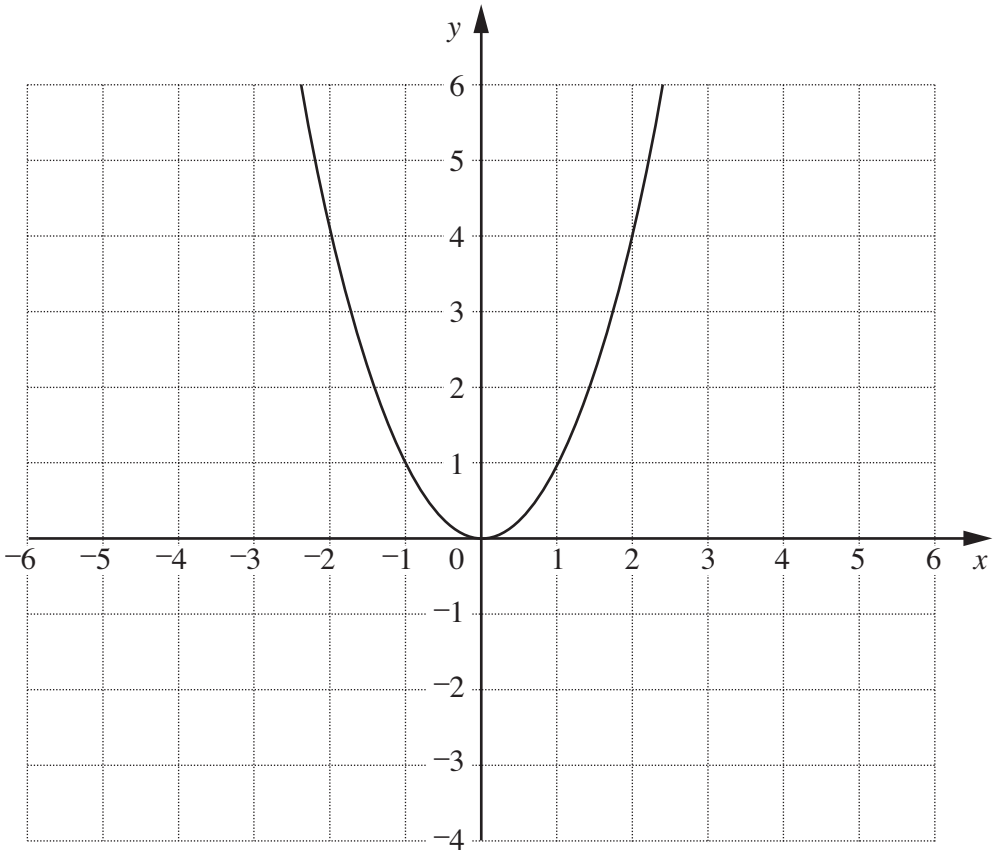
(b) Use your answer to part **(a)** to write down the minimum value of

$$x^2 + 6x - 6.$$

(b) .....[1]

4

5 This is the graph of $y = x^2$.



(a) On the same grid, **sketch** the graph of

(i) $y = (x + 2)^2$,

(ii) $y = x^2 - 3$. [2]

(b) Describe the transformation which maps $y = x^2$ onto $y = (x + 2)^2 - 3$.

.....

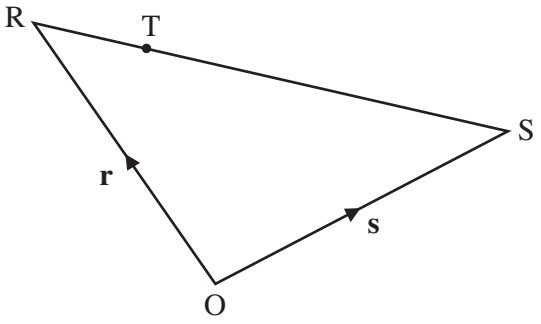
.....

.....[2]

4

6 ORS is a triangle.
T is the point on RS such that RT = $\frac{1}{4}$RS.

$\overrightarrow{OR} = \mathbf{r}$ and $\overrightarrow{OS} = \mathbf{s}$.



Not to scale

(a) Find, in terms of **r** and **s**,

(i) $\overrightarrow{SR}$,

(a)(i) $\overrightarrow{SR}$ = ...[1]

(ii) $\overrightarrow{ST}$.

(ii) $\overrightarrow{ST}$ = ...[1]

(b) Find $\overrightarrow{OT}$ in terms of **r** and **s**.
Give your answer in its simplest form.

(b) $\overrightarrow{OT}$ = ...[2]

4

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