**MATHEMATICS C
(Graduated Assessment)**

1966/2339B

MODULE M9 – 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 8.
* 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 6 printed pages and 2 blank pages.

[Turn over

Formulae Sheet

Volume of prism = (area of cross-section) × length
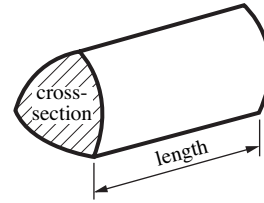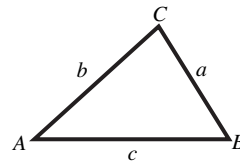
In any triangle *ABC*

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

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

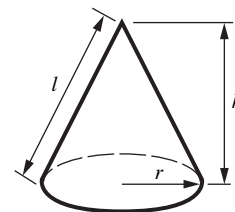**Area of triangle** = $\frac{1}{2} ab \sin C$

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

Surface area of sphere = $4\pi r^2$
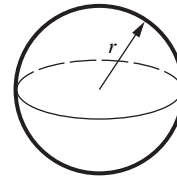
Volume of cone = $\frac{1}{3} \pi r^2 h$

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

8 All lengths in this diagram are in centimetres.
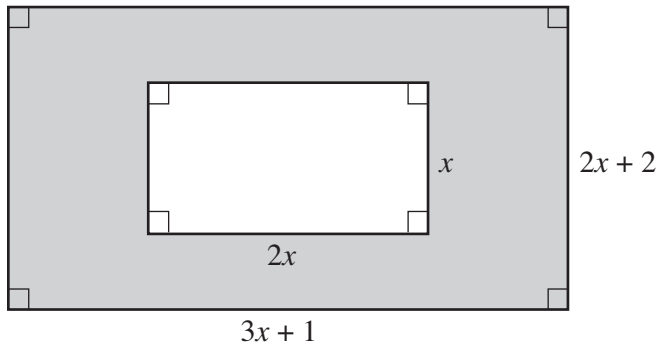
Not to scale

(a) Expand and simplify.

$$(3x + 1)(2x + 2)$$

(a) ....[2]

(b) Given that the shaded area in the diagram is $142 \, \text{cm}^2$, show that

$$x^2 + 2x - 35 = 0.$$

....

....

....[3]

(c) Solve by factorising.

$$x^2 + 2x - 35 = 0$$

(c) ....[3]

[Turn over

9

A case weighs 4 kg correct to the nearest kilogram.

Calculate the upper bound of the total weight of 12 of these cases.
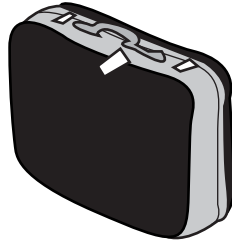
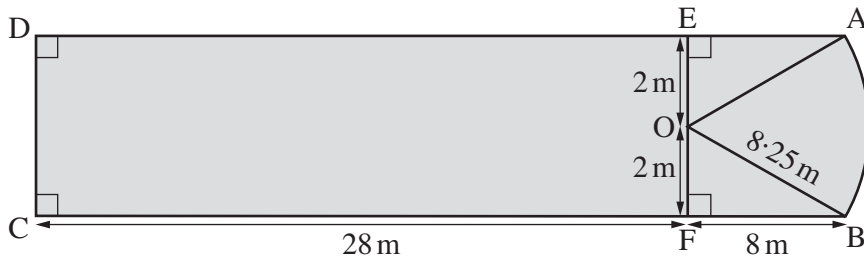.....................................kg [2]

2

10   Rearrange this formula to make d the subject.

$$cd = 5(d - e)$$

....[3]

3

11 Part of a sports field is marked out for a javelin competition.

AB is an arc of a circle, centre O, with radius 8·25 m.
EO = OF = 2 m.
BF = 8 m, CF = 28 m.

(a) Show that angle FOB = 76°, to the nearest degree.

....

....

....

....[2]

(b) (i) Calculate the area of the sector AOB.

(b)(i) ....m^2 [3]

(ii) Calculate the shaded area ABCD.

(ii) ....m^2 [2]

7

[Turn over

12 These two glasses are similar.
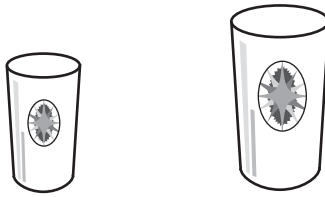
The **capacity** of the large glass is **double** the capacity of the small glass.
The height of the small glass is 13·5 cm.

(a) Kirsty thinks that the height of the large glass is 27 cm.
Ben thinks that the height of the large glass is about 17 cm.

Ben is correct.
Show clearly why the height of the large glass is about 17 cm.

....

....

....

....

....[3]

(b) The area of the logo on the small glass is 20 cm^2.

Calculate the area of the logo on the large glass.

(b) ....cm^2 [2]

5

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

8

BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE