OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS B (MEI)

Paper 1 Section B (Higher Tier)

THURSDAY 10 JANUARY 2008

H

B263B

Morning

Time: 45 minutes

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

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

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 **36**.
- Section B starts with question 9.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
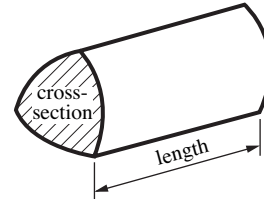
FOR EXAMINER'S USE

SECTION B	

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

[Turn over

Formulae Sheet: Higher Tier

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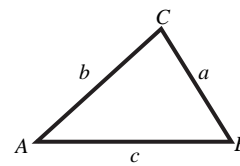
In any triangle *ABC*

Sine rule $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$
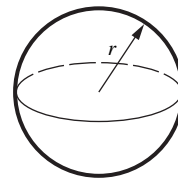
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

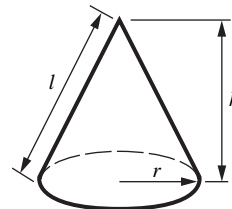**Area of triangle** = $\frac{1}{2} ab \sin C$

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

9 Calculate the following.

(a) $\dfrac{694.8}{93.5 - 31.8}$

Give your answer correct to 1 decimal place.

(a)......................................[2]

(b) $\sqrt{652.87 + 345.69}$

(b) ....[1]

10 The cost of a holiday was £2465.
This cost was split between accommodation and travel in the ratio 7 : 10.

What was the cost of the accommodation?

£ ....[2]

11 (a) Find the value of $5a + 2b$ when $a = 3.2$ and $b = -1.8$.

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

(b) Solve this equation.
$$5(x + 2) = 13$$

(b) ....[3]

12 The time taken for the first goal to be scored in each of 100 netball games is recorded.
The information is summarised in the table below.

Time (t seconds)	Number of matches
$0 < t \leq 20$	1
$20 < t \leq 40$	4
$40 < t \leq 60$	22
$60 < t \leq 80$	26
$80 < t \leq 100$	31
$100 < t \leq 120$	16

(a) Write down the modal class.

(a)....................... seconds [1]

(b) One of these games is chosen at random.

What is the probability that the first goal in this game was scored after more than 80 seconds?

(b) ....[2]

(c) Calculate an estimate of the mean of these times.

(c)....................... seconds [4]

13 (a) ABCD is a rectangle, in which AB = 35 cm and BC = 24 cm.
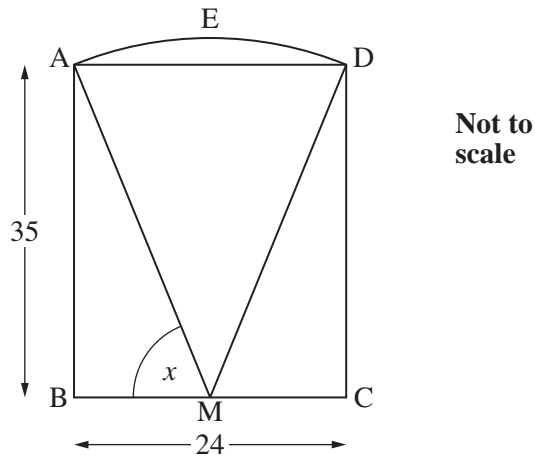M is the midpoint of BC.
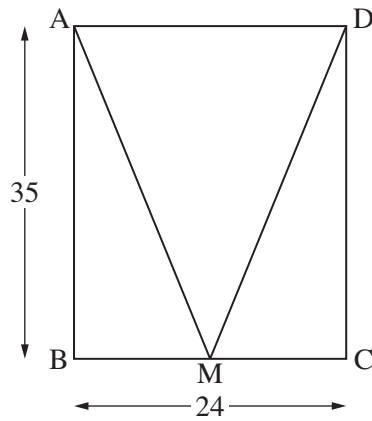
(i) Find the area of triangle ABM.

(a)(i) ....cm^2 [2]

(ii) Show that AM = 37 cm. [2]

(b) The diagram in part **(a)** forms part of a logo.
The complete logo is shown below.

(i) Calculate angle x.

(b)(i)...............................° [3]

(ii) AED is an arc of the circle with centre M and radius 37 cm.

Find the total area of the logo.

(ii) ....cm^2 [5]

TURN OVER FOR QUESTION 14

14 **(a)** Solve these simultaneous equations algebraically.

$$5x + y = 17$$
$$3x + y = 9$$

(a) $x =$ ....

$y =$ ....[2]

(b) Multiply out and simplify.

$$(4x + y)(2x - 5y)$$

(b) ....[3]

(c) Solve this equation.
$$x^2 + 7x + 5 = 0.$$

Give your answers correct to 2 decimal places.

(c) .... and ....[3]