



H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS B (MEI)

Paper 3 Section A (Higher Tier)

B293A

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:

- Geometrical instruments
- Tracing paper (optional)

Monday 6 June 2011
Afternoon

Duration: 45 minutes



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- 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.

INFORMATION FOR CANDIDATES

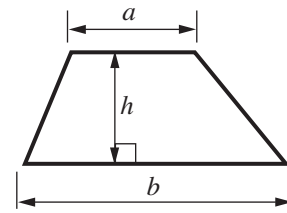
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this Section is **36**.
- This document consists of **8** pages. Any blank pages are indicated.

WARNING

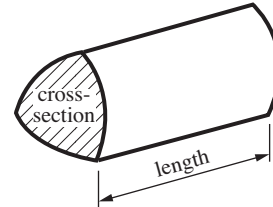
No calculator can be used for Section A of this paper

Formulae Sheet: Higher Tier

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) \times length

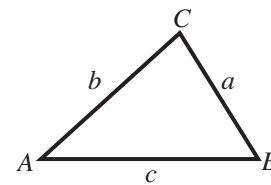


In any triangle ABC

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

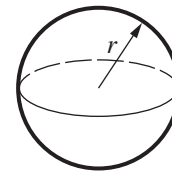
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



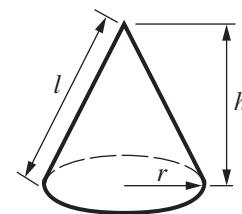
Volume of sphere = $\frac{4}{3}\pi r^3$

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

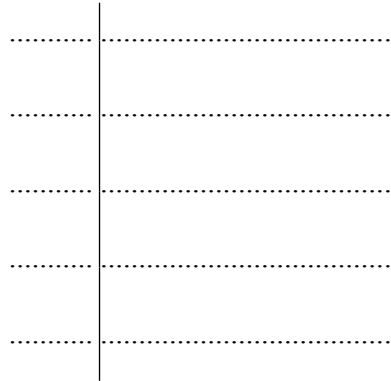
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

PLEASE DO NOT WRITE ON THIS PAGE

- 1 Adam works as a driver for a delivery company.
He recorded the number of miles he drove each day for 13 days.
His data were as follows.

40 11 28 17 53 25 46 29 37 38 55 45 47

Construct an ordered stem and leaf diagram to illustrate these data.



Key: | represents miles [3]

- 2 (a) Factorise the following.

(i) $x^2 - 16x$

(a)(i) [1]

(ii) $x^2 - 16$

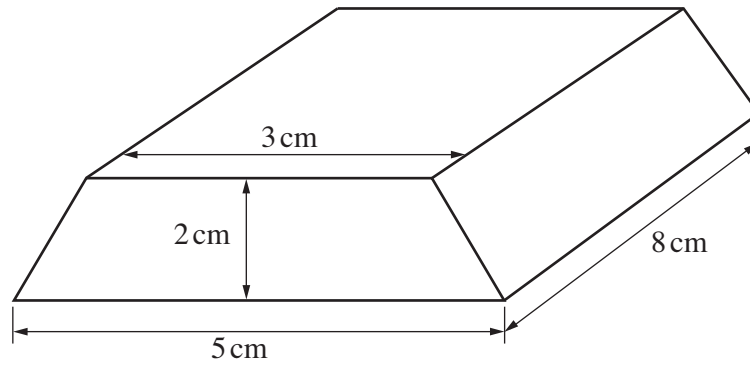
(ii) [1]

- (b) Expand the following.

$x^3(x - 7)$

(b) [2]

- 3 The base for a trophy is a prism.
The cross-section of the prism is a trapezium.



- (a) Find the area of the cross-section.

(a) cm^2 [2]

- (b) Hence find the volume of the base for the trophy.

(b) cm^3 [2]

- 4 A company has 240 employees.
The 240 employees were asked by their trade union to vote on whether to go on strike.
150 of the employees voted.
96 of these voted YES.

(a) What percentage of the 150 voted YES?

(a) % [2]

(b) The trade union concluded that this represented a majority voting YES.
The company calculated the percentage voting YES based on the total number of employees.

Decide whether the company came to the same conclusion as the trade union.
Show all your working.

.....
.....
.....
.....
..... [3]

- 5 Work out the following.
Give each answer as a mixed number in its simplest form.

(a) $2\frac{1}{2} + 1\frac{2}{5}$

(a) [3]

(b) $2\frac{1}{2} \times 1\frac{2}{5}$

(a) [3]

Turn over

6 Solve the following equations.

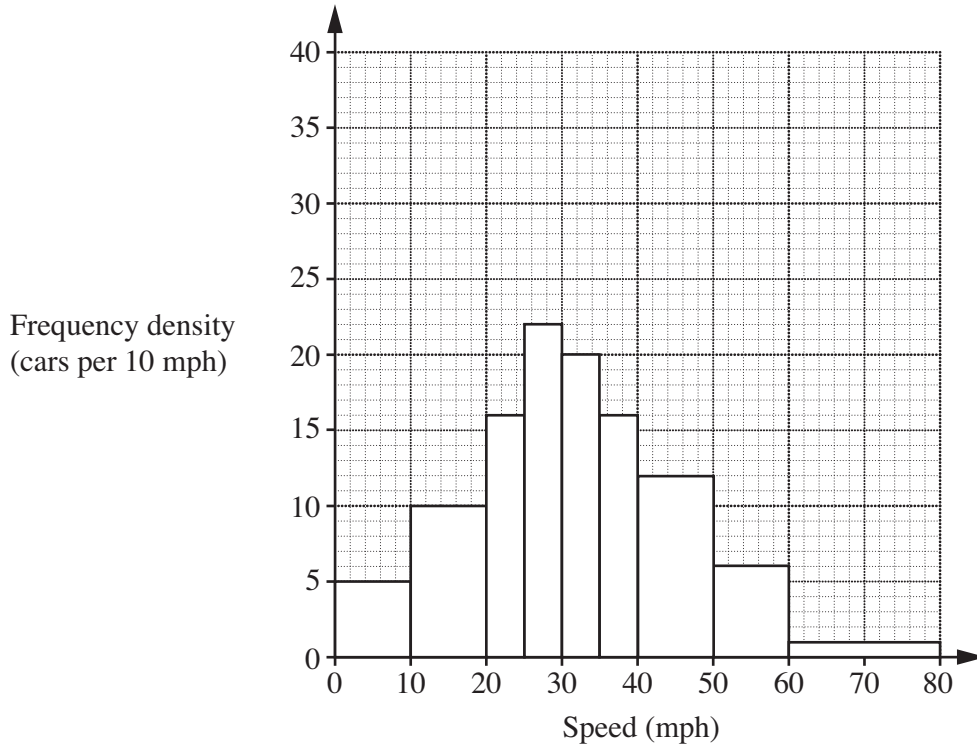
(a) $3(x - 4) = 21$

(a) [3]

(b) $\frac{x}{4} - 1 = 5$

(b) [2]

- 7 On a certain stretch of road, cars were timed and their average speeds calculated. The data obtained are displayed in the histogram below.



- (a) How many cars were timed?

(a) [3]

- (b) On this particular stretch of road the speed limit is 40 mph.
On the evidence of these data, what fraction of cars exceed this speed limit?

(b) [2]

TURN OVER FOR QUESTION 8

8 (a) Write down the value of each of the following.

(i) 2^{-3}

(a)(i) [1]

(ii) 3^0

(ii) [1]

(b) $357\,560\,000\text{ km}^2$ of the earth's surface is covered by water.
This can be written as $3.5756 \times 10^n \text{ km}^2$.

Write down the value of n .

(b) [1]

(c) Write 0.000 49 in standard form.

(c) [1]



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