M4

OCR RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M4 – SECTION B

B274B

Monday 9 March 2009
Morning

Duration: 30 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number					

INSTRUCTIONS TO CANDIDATES

* Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
* Use 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.
* Write your answer to each question in the space provided, however additional paper may be used if necessary.
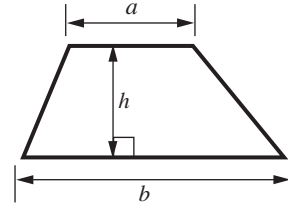
INFORMATION FOR CANDIDATES

* The number of marks is given in brackets **[ ]** at the end of each question or part question.
* Section B starts with question 7.
* You are expected to use a calculator in Section B of this paper.
* The total number of marks for this Section is **25**.
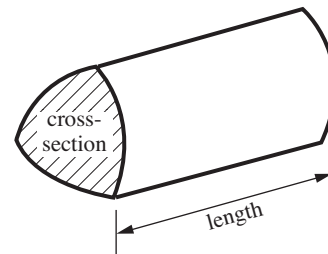* This document consists of **12** pages. Any blank pages are indicated.

FOR EXAMINER'S USE

SECTION B	

Turn over

2

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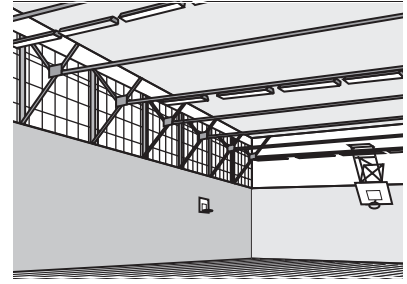
Area of trapezium $= \frac{1}{2}(a+b)h$

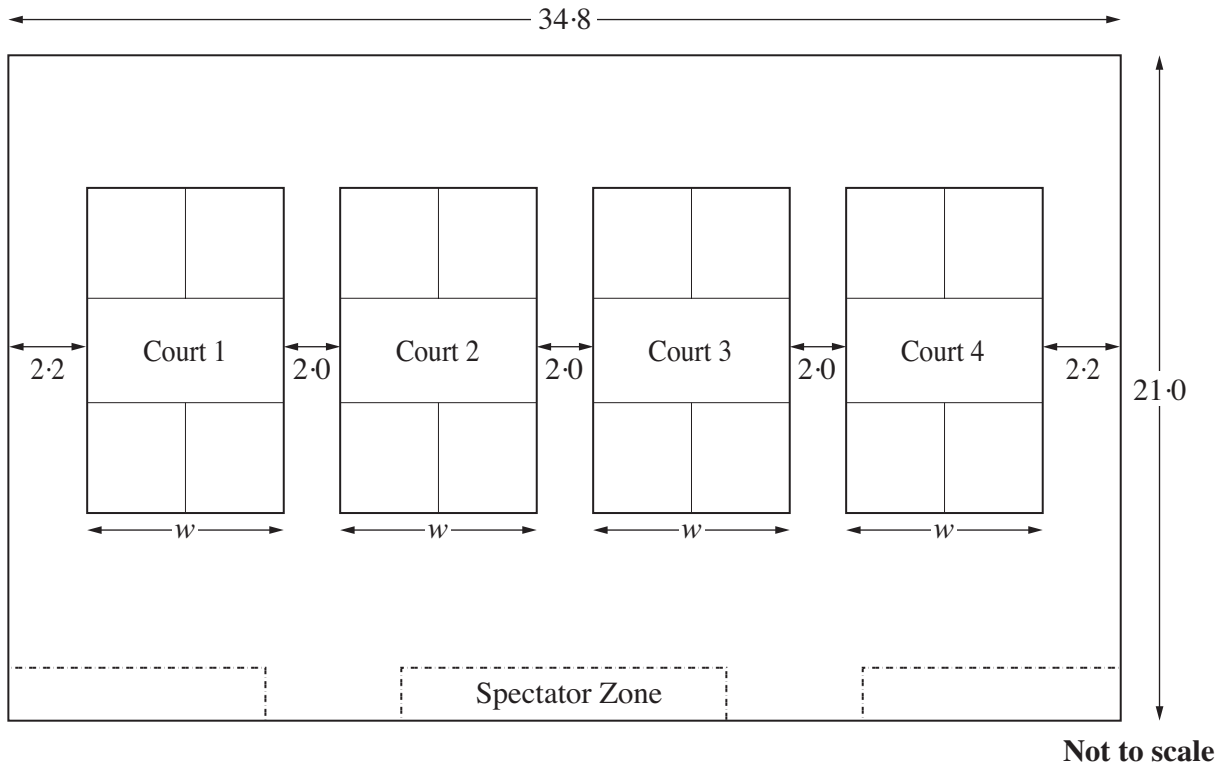**Volume of prism** = (area of cross-section) × length

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7 Sports halls can be laid out in many different ways.

This sketch shows one way of laying out a sports hall.
There are four identical games courts.
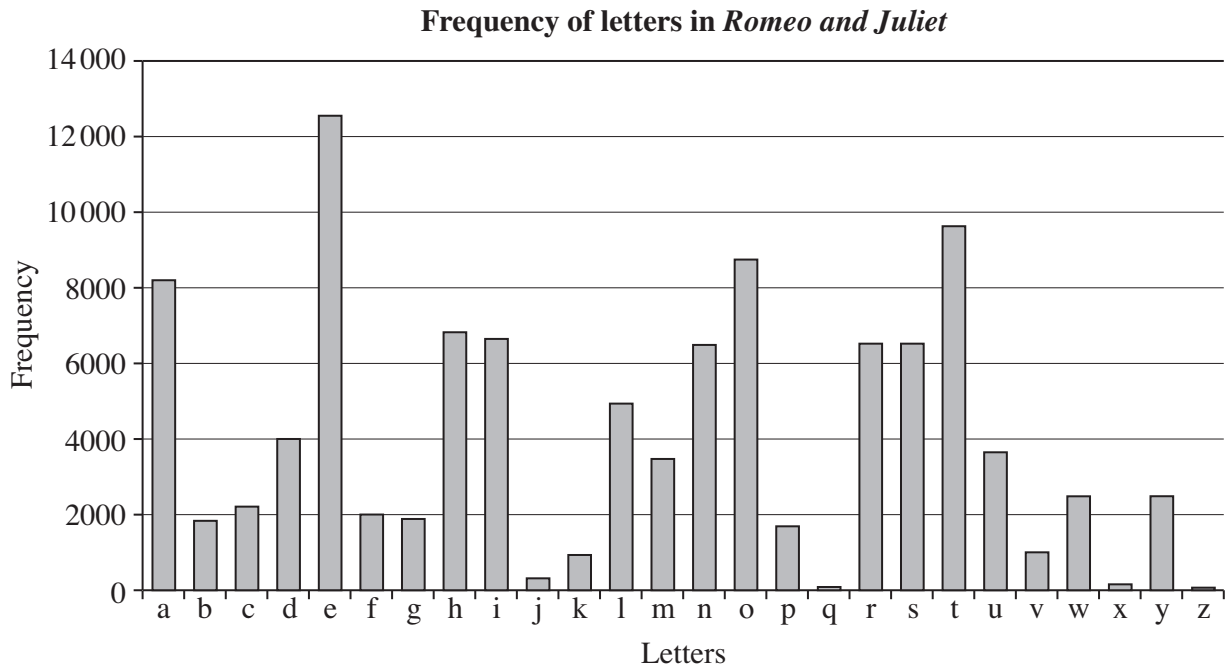All the lengths on the sketch are in metres.

Not to scale

Calculate the width, *w*, of **one** court.

.... m **[4]**

8 **(a)** This chart shows the frequencies of letters occurring in the play *Romeo and Juliet*.

Frequency of letters in *Romeo and Juliet*

Which four letters occurred the **least** often?

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

(b) *Romeo and Juliet* has been translated into German.

	Total number of letters	Total number of words
English *Romeo and Juliet*	105 687	27 028
German *Romeo and Juliet*	131 649	27 260

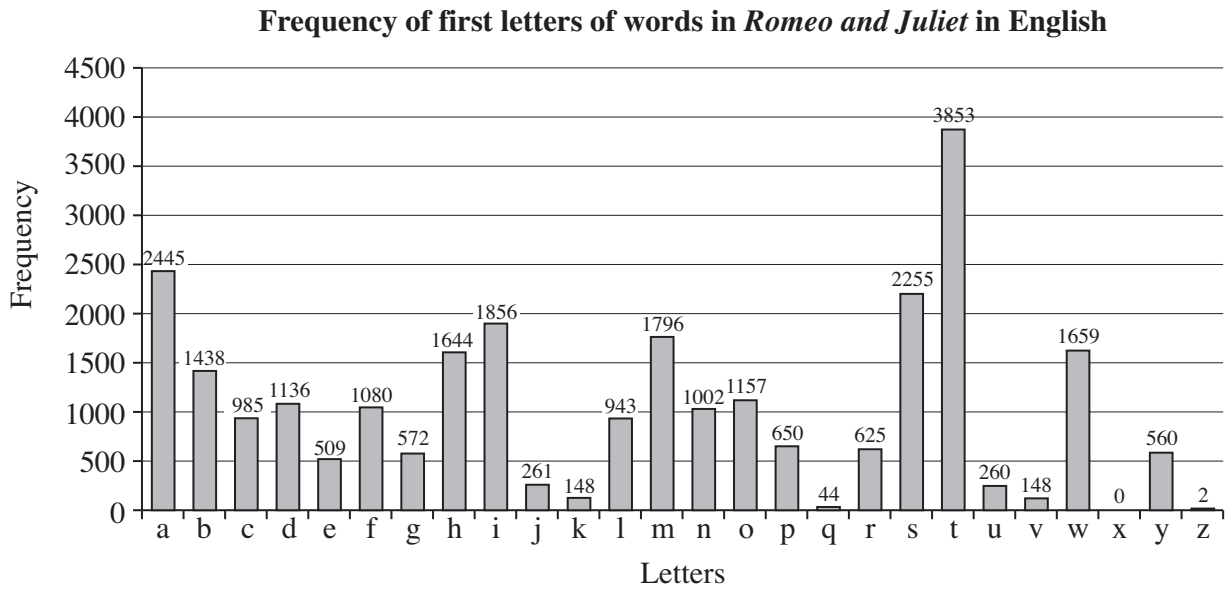The mean number of letters in a word in the English version is 3·9.

(i) Use information from the table to calculate the mean number of letters in a word in the German version.

(b)(i) .... **[2]**

(ii) Make one comparison between word lengths in the English and German versions.

....

.... **[1]**

(c) This bar chart shows the frequency of the first letters of the 27 028 words in *Romeo and Juliet*.

Frequency of first letters of words in *Romeo and Juliet* in English

Use the bar chart to answer these questions.

A word is chosen at random from the English version of *Romeo and Juliet*.

(i) Which letter is **most likely** to be the first letter of the word?
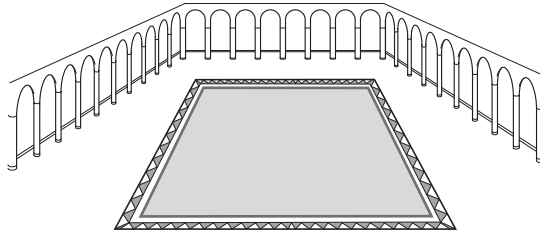Give a reason for your answer.

The letter .... because ....

.... **[2]**

(ii) Write down the probability that the first letter of the chosen word is 'a'.

(c)(ii) .... **[2]**

Turn over

9 The world's largest hand-woven carpet was produced in Iran, in 2000.

(a) It is rectangular in shape.
It measures 70·1 m by 60·9 m.

Calculate the area of the carpet.

(a) .... m^2 **[2]**

(b) One square metre of the carpet weighs 11 pounds.

Roughly, what is 11 pounds in kilograms?

(b) .... kg **[1]**

10 Noni is doing a puzzle.
She has to find two whole numbers which

- added together give 30
- multiplied together give 144.

Use trial and improvement to find Noni's two numbers.
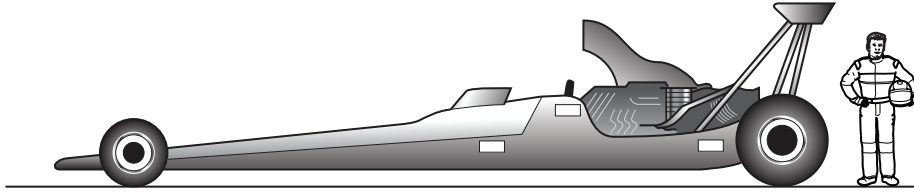Record your trials in the table below.
Two have been done for you.

First number (⬟)	Second number (★)	(First number) × (Second number)	Too small	Too large
1	29	1 × 29 = 29	✓	
10	20	10 × 20 = 200		✓

The two numbers are .... and ....**[3]**

Turn over

11 In drag racing, dragsters are timed over a quarter of a mile.

   (a) Estimate, in metres, the length of this dragster.

(a) .... m   **[1]**

   (b) Here are the times for the winner of the Las Vegas drag races in 2006.

Race	Time (seconds)
Round One	4·488
Quarter-final	4·538
Semi-final	4·494
Final	4·469

   (i) Which race took the longest time?

(b)(i) .... **[1]**

   (ii) In the final, the winner took 0·081 seconds less than his opponent.

   How long did his opponent take?

(ii) .... seconds **[1]**

(c) This graph shows the distance travelled by a dragster in a race.
Use the graph to answer the questions below.

Distance travelled by dragster

(i) How far did the dragster travel in the first second?

(c)(i) .... m **[1]**

(ii) How long did the dragster take to cover the first 100 m?

(ii) .... seconds **[1]**

(iii) How far did the dragster travel between **A** and **B**?

(iii) .... m **[2]**

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