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RECOGNISING ACHIEVEMENT

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B263A

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS B (MEI)

Paper 3 Section A (Higher Tier)

MONDAY 19 MAY 2008

Morning
Time: 45 minutes

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
Geometrical instruments
Tracing paper (optional)

CUP/T45383

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.
- Answer **all** the questions.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar codes.
- 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**.

WARNING
You are not allowed to use a calculator in Section A of this paper.

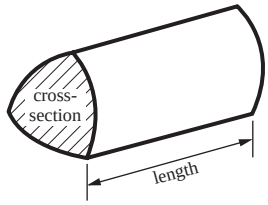
FOR EXAMINER'S USE	
SECTION A	
SECTION B	
TOTAL	

This document consists of **11** printed pages and **1** blank page.

[Turn over

Formulae Sheet: Higher Tier

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

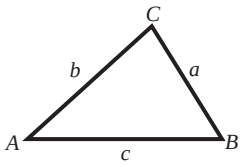


In any triangle *ABC*

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

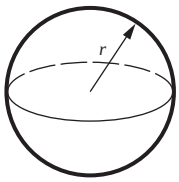
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



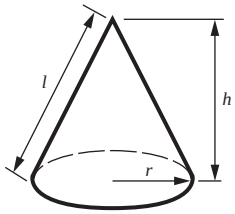
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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1 There are 200 students in a school.
Of these, 86 are boys.

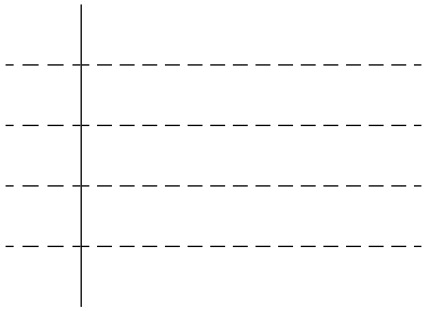
Find 86 out of 200 as a percentage.

..... % [2]

2 This list shows the number of minutes taken by each of 11 students to travel to school.

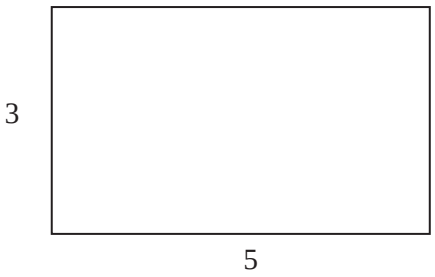
23	42	37	34	28	25
41	28	36	30	43	

Show this information in an ordered stem and leaf diagram.

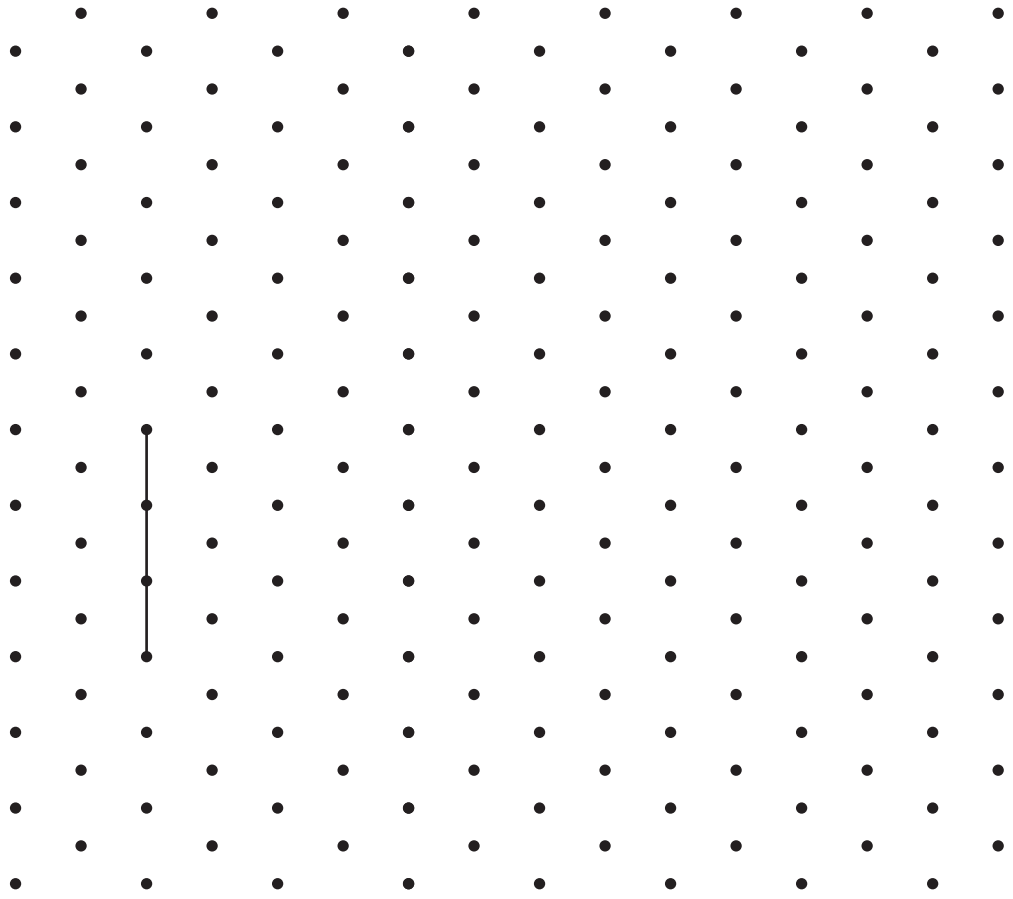


Key ..... means.....
[3]

3 The diagram shows the front view of a cuboid.
The cuboid is 5 cm by 3 cm by 4 cm.



On the grid make a full size isometric drawing of the cuboid.
One edge has been drawn for you.



[2]

4 **(a)** Given that $27.9 \times 316 = 8816.4$ write down the value of 279×3.16.

(a) ..... [1]

(b) **Estimate** the value of $\dfrac{393.7 \times 19.7}{80.3}$.

Show all your approximations.

(b) ..... [2]

5 **(a)** Solve the equation $2(x - 7) = 5$.

(a) ..... [3]

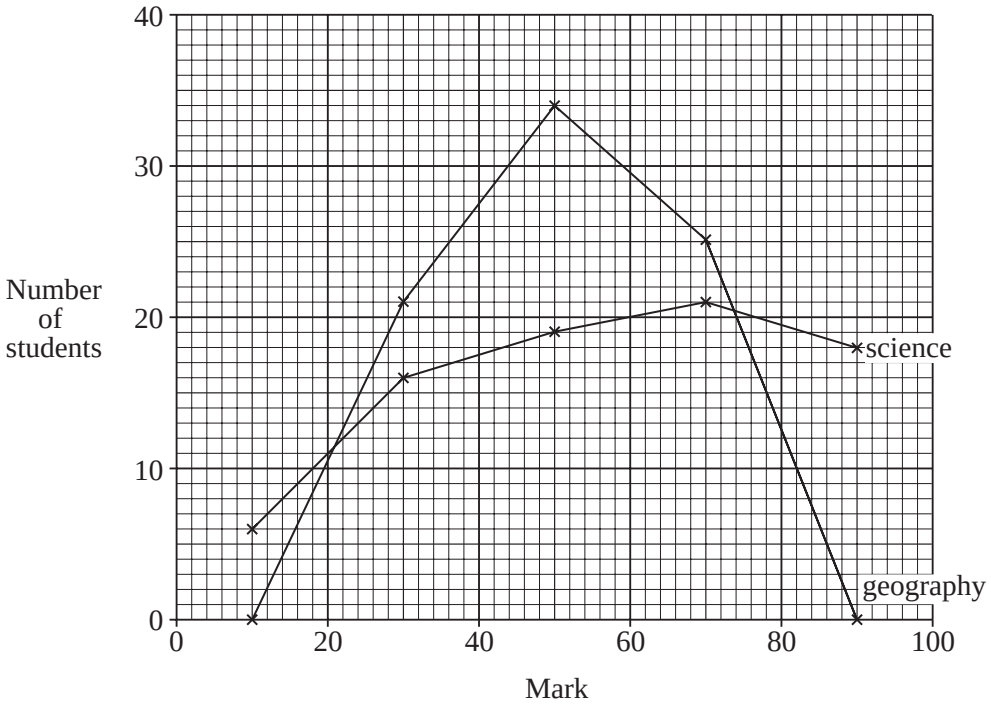
(b) Solve the inequality $4y - 5 < 19$.

(b) ..... [2]

(c) Rearrange the formula $v = u + 10t$ to make t the subject.

(c) t = ... [2]

6 The frequency polygons summarise the marks of 80 students in a geography examination and in a science examination.



Make two comparisons between the distributions of marks.

1.....

.....

..... [1]

2.....

.....

..... [1]

7 Work out the following.
Give each answer as a mixed number.

(a) $4\frac{2}{3}+1\frac{3}{4}$

(a) ..... [3]

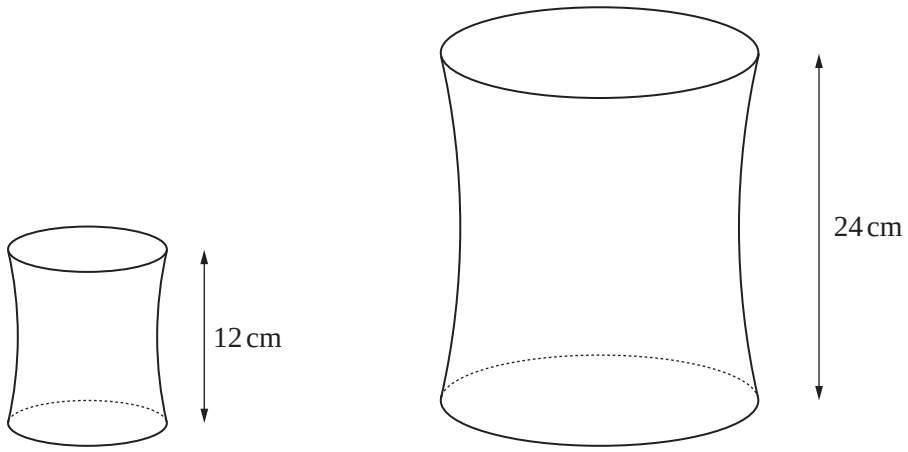
(b) $5\frac{1}{4}\div1\frac{7}{8}$

(b) ..... [3]

8 Find the least common multiple of 20 and 24.

..... [2]

9 The diagram shows two mathematically similar containers.
The height of the small container is 12 cm and the height of the large container is 24 cm.



(a) The area of the base of the small container is 50 cm^2.

Calculate the area of the base of the large container.

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

(b) The volume of the large container is 4000 cm^3.

Calculate the volume of the small container.

(b) ..... cm^3 [2]

TURN OVER FOR QUESTION 10

10 **(a)** By completing the square, or otherwise, find the integers p and q such that

$$x^2 + 8x + 21 = (x + p)^2 + q.$$

(a) p = ...

q = ... [3]

(b) Use your answer to part **(a)** to explain why you cannot find a solution to the equation

$$x^2 + 8x + 21 = 0.$$ [2]

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