



Rewarding Learning

General Certificate of Secondary Education
January 2009

Mathematics



Module N4 Paper 2
(With calculator)
Higher Tier
[GMN42]



GMN42

FRIDAY 9 JANUARY
10.30 am – 11.30 am

StudentBounty.com

Centre Number
71
Candidate Number

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all nine** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

INFORMATION FOR CANDIDATES

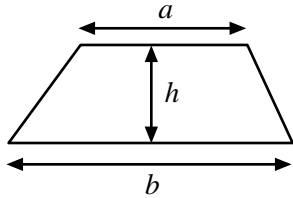
The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	

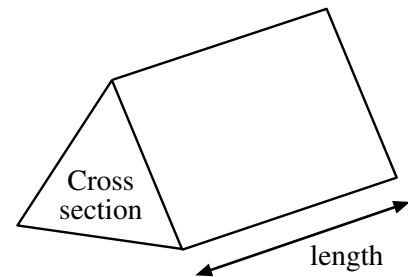
Total Marks	
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Formula Sheet

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



Volume of prism = area of cross section \times length

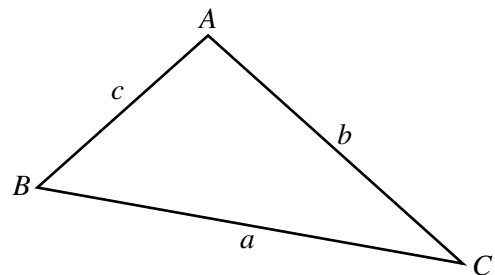


In any triangle ABC

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

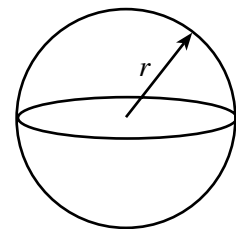
Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



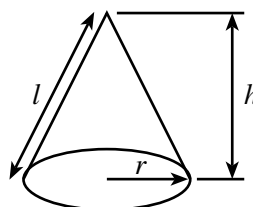
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



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

Curved surface area of cone = $\pi r l$



Quadratic equation:

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

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

- 6 A hotel sun terrace has a rectangular swimming pool measuring $x + 16$ metres by $2x + 6$ metres. A patio area on two sides of the swimming pool is x metres wide.

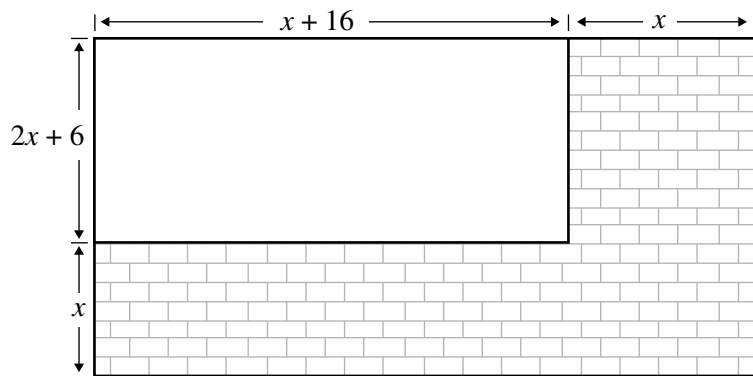


Diagram not drawn accurately

- (a) If the terrace has a total area of 504 m^2 , show that this total area can be satisfied by the quadratic equation

$$x^2 + 10x - 68 = 0$$

[3]

- (b) Solve this equation to find the width of the patio.

Answer $x = \underline{\hspace{2cm}}$ m [3]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

- 7 The lengths of time, in minutes, that aircraft spent waiting for clearance at a busy airport were recorded. Some of this information is shown in the table below and in the histogram opposite.

Time (x minutes)	Frequency
$0 < x \leq 10$	28
$10 < x \leq 14$	
$14 < x \leq 20$	
$20 < x \leq 25$	18
$25 < x \leq 32$	7
$32 < x \leq 36$	10

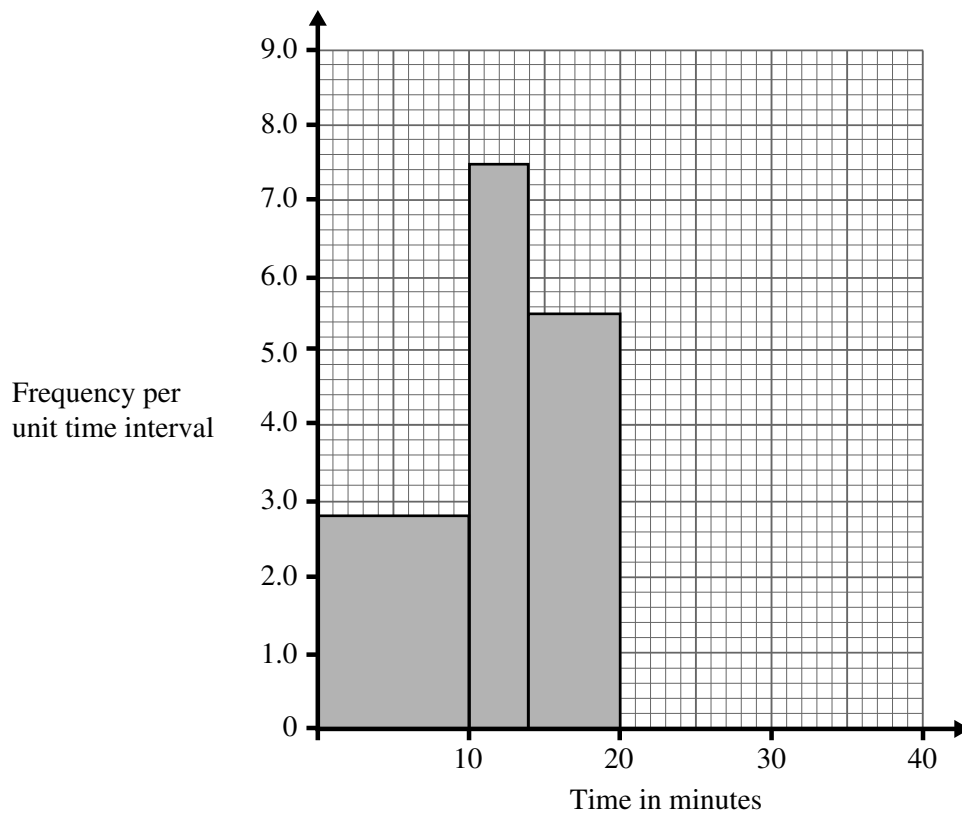
- (a) Use the data displayed in the histogram to complete the table. [2]
- (b) Use the data displayed in the table to complete the histogram. [2]
- (c) Estimate the number of aircraft which waited for a time greater than the mid-value of the modal class.

Answer _____ [3]

- (d) Describe what is meant by a 'stratified sample'.

[2]

Examiner Only	
Marks	Remark



- (e) A stratified sample of 28 aircraft which waited for more than 10 minutes was taken. How many of the aircraft in this sample waited between 25 and 32 minutes?
Show your working.

Answer _____[3]

- 8 The diagram shows the position of two trees D and E on the bank of a river. The river banks are parallel. F is the position of another tree on the opposite side of the river.

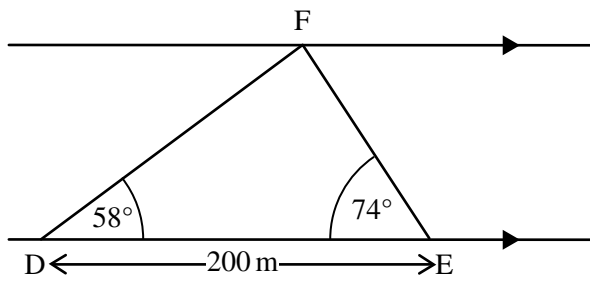


Diagram not drawn accurately

Calculate the width of the river.

Answer _____ m [4]

Examiner Only	
Marks	Remark

9 Solve

$$2(x-1) + \frac{2}{x-1} = 5$$

Show your working.

A solution by trial and improvement will not be accepted.

Answer $x =$ _____ [6]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER
