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General Certificate of Secondary Education  
2009

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71	
Candidate Number	
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## Mathematics



Module N3 Paper 2  
(With calculator)  
Higher Tier  
[GMN32]



GMN32

MONDAY 18 MAY  
2.45 pm – 3.45 pm

### 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 twelve** questions.  
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

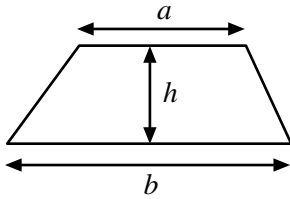
### INFORMATION FOR CANDIDATES

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.

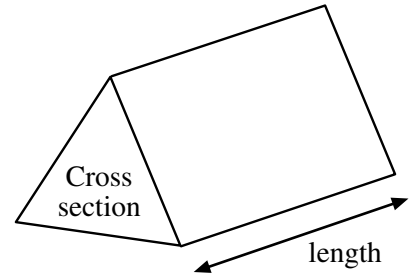
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
<b>Total Marks</b>	

# Formula Sheet

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



**Volume of prism** = area of cross section  $\times$  length

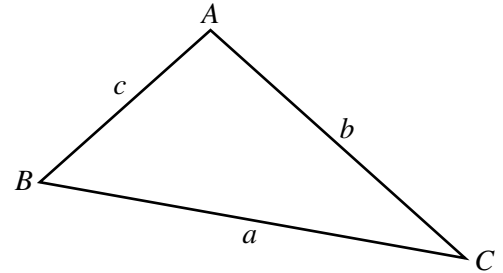


**In any triangle ABC**

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

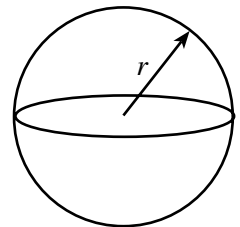
**Sine rule:**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



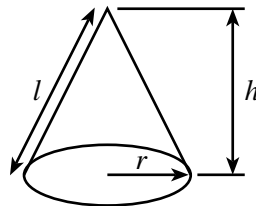
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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











- 11** The number of trees undamaged in an orchard after a hurricane was 220. It was observed that 12% had been damaged. How many trees were in the orchard before the hurricane?

Answer \_\_\_\_\_ [3]

- 12** Peter is a gardener. He recorded how much money he made each week for 40 weeks.

Money in £ ( $m$ )	Frequency	Money in £	Cumulative frequency
$180 \leq m < 200$	4	$< 200$	4
$200 \leq m < 220$	7	$< 220$	11
$220 \leq m < 240$	12	$< 240$	
$240 \leq m < 260$	9		
$260 \leq m < 280$	5		
$280 \leq m < 300$	2		
$300 \leq m < 320$	1		

(a) Complete the table. [1]

(b) Draw the cumulative frequency graph on the opposite page. [3]

(c) Use the graph to estimate

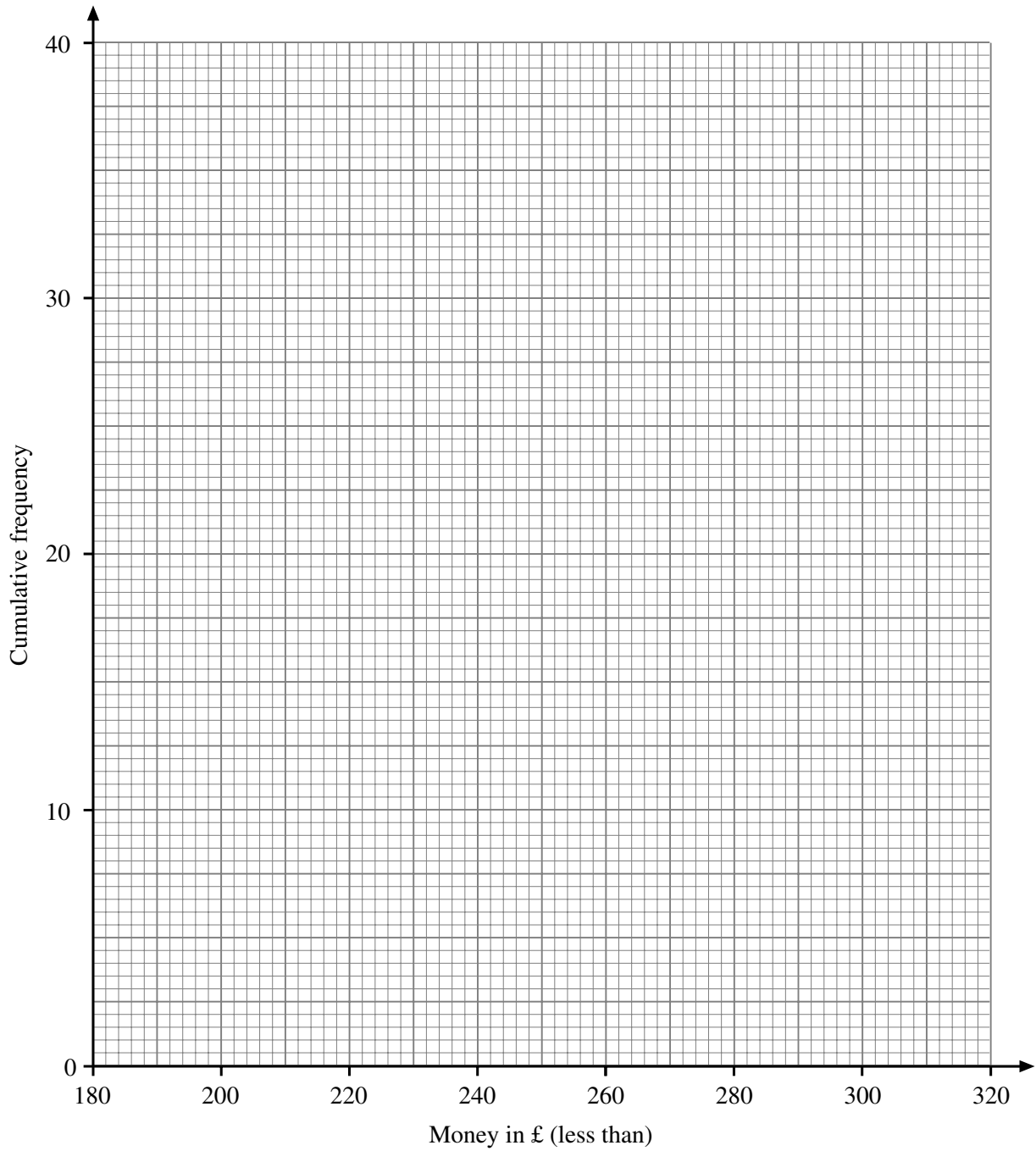
(i) the median,

Answer £ \_\_\_\_\_ [1]

(ii) the inter-quartile range.

Answer £ \_\_\_\_\_ [2]





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**THIS IS THE END OF THE QUESTION PAPER**

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