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General Certificate of Secondary Education 2009

Mathematics



Module N3 Paper 2 (With calculator) Higher Tier [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.

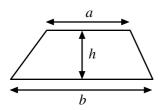
The Formula Sheet is on page 2.

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

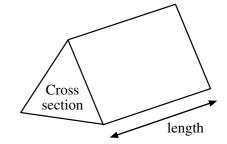
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section \times length

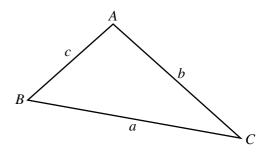


In any triangle ABC

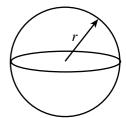
Area of triangle = $\frac{1}{2} ab \sin C$

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

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

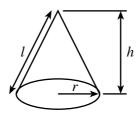


Volume of sphere = $\frac{4}{3}\pi r^3$ Surface area of sphere = $4\pi r^2$



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

Curved surface area of cone = πrl

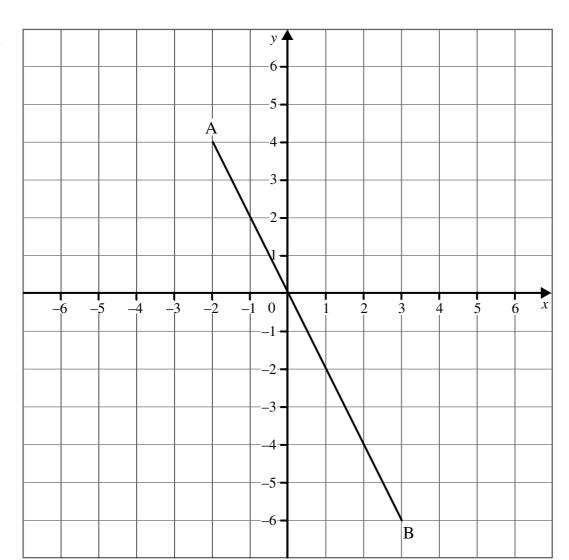


Quadratic equation:

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

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





Examiner Only

Marks Remark

A is the point (-2, 4). B is the point (3, -6).

Find the midpoint of AB.

Answer (____, ____) [2]

2	The heights	(in cer	ntimetr	es) of	twenty	boys	in a lo	ocal ho	ckey (club are	:	Examin Marks	er Only Remark
	181 166		162 177	153 167	182 178	171 167	163 178	158 167	185 169	174 168			
	Construct a	stem a	nd leaf	diagra	am to	illustra	ate the	se heig	ghts.				
											[3]		
3	A wardrobe In a sale its Calculate th	price v	vas red	uced b									
							A	nswer	£		[3]		

4	Construct a rhombus of side 6.5 cm which has one of its diagonals 5 cm in length.	Examiner Only Marks Remark
	[4]	
5	Katy wants to know how many times a month, on average, the people in her town go to the cinema. She asks 200 pupils in her school.	
	Explain why Katy's sample may not be representative of the people in her town.	
	Answer	
	[1]	

6	(a) Expand and simplify $4(2a + 3) - 7$		Examiner Only Marks Remar
		Answer [2]	
	(b) Factorise		
	(i) 6 <i>a</i> – 10		
		Answer [1]	
	(ii) $a^2 + a$		
		Answer [1]	
7	A man is filling his garden pond with water and empty it into the pond every 25 second. The bucket holds 15 litres of water. It takes the man 4 minutes and 35 seconds	ds.	
	What volume of water does the pond hold?	?	
		Answer [4]	
8	Use trial and improvement to solve $x^3 - 2x$ giving the answer correct to 1 decimal place. Show your working.		

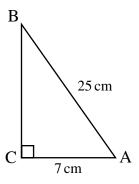
Answer _____ [4]

£2500 is placed in a bank account and gains 4% compound interest per 9

What should be the total amount in the account at the end of 3 years?

Answer £ _____[3]

10



(a) Calculate the length of BC in the right-angled triangle.

Answer _____ cm [3]

(b) Calculate the size of angle BAC.

Answer _____° [3]

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?

Examiner Only					
Marks	Remark				

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
$180 \le m < 200$	4	< 200	4
$200 \le m < 220$	7	< 220	11
$220 \le m < 240$	12	< 240	
$240 \le m < 260$	9		
$260 \le m < 280$	5		
$280 \le m < 300$	2		
$300 \le m < 320$	1		

(a) Complete the table.

[1]

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

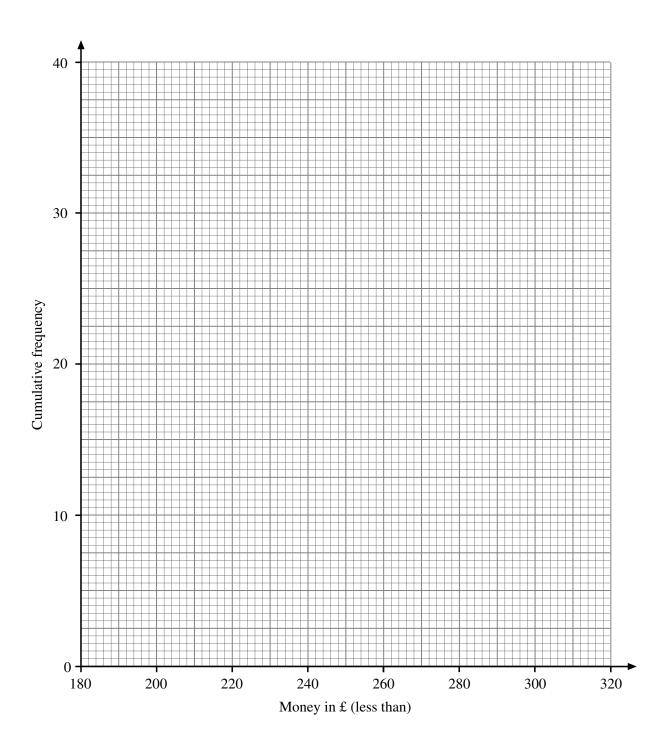
[3]

- (c) Use the graph to estimate
 - (i) the median,

Answer £_____[1]

(ii) the inter-quartile range.

Answer £_____ [2]



THIS IS THE END OF THE QUESTION PAPER



