

71
Candidate Num

General Certificate of Secondary Education 2011

Mathematics



Module N4 Paper 2
(With calculator)
Higher Tier

[GMN42]

TUESDAY 31 MAY 10.30 am – 11.30 am



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 ten** 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.

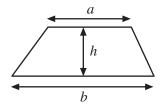
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total	
Marks	

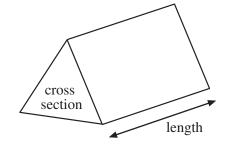
6392

Formula Sheet

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



Volume of prism = area of cross section \times length

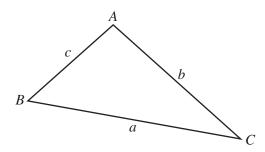


In any triangle ABC

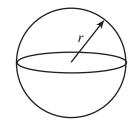
Area of triangle = $\frac{1}{2} ab \sin C$

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

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

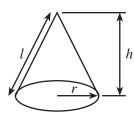


Volume of sphere = $\frac{4}{3}\pi r^3$ Surface area of sphere = $4\pi r^2$



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

Curved surface area of cone = πrl



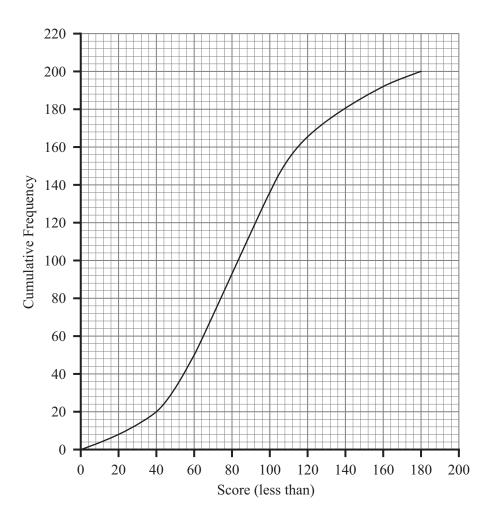
Quadratic equation:

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

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

1	A large spherical glass marble has a radius of 2.5 cm. Calculate the volume of glass in this marble correct to 2 decimal places. © iStockphoto/Thinkstock	Examiner Only Marks Remark
	Answer [3]	
2	A tea set has a sale price of £63.36 which is a saving of 12% on the original price. What was the original price of the tea set?	
	Answer £ [3]	

The graph opposite shows the cumulation darts tournament.	ve frequency of scores ol	otained in a	Examiner Only Marks Remark
(a) Use the graph to estimate			
(i) the median,			
	Answer	[1]	
(ii) the inter-quartile range,			
	Answer	[2]	
(iii) how many scores were more the	nan 150		
	Answer	[2]	

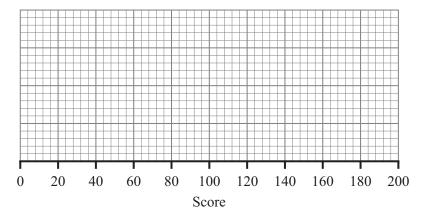


Examiner Only

Marks Remark

(b) From the graph draw a box plot.

[3]



4 (a) Simplify $\frac{2}{3c} - \frac{1}{4c}$

Examiner Only		
Marks	Remark	

Answer [2]

(b) Factorise $4x^2 - 25y^2$

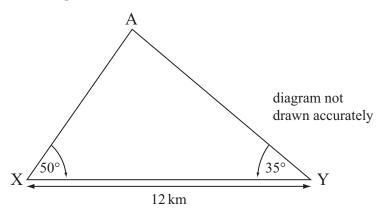
Answer _____ [2]

5 A small aircraft, located at position A in the sketch diagram, develops an engine fault while flying between two landing strips located at positions X and Y in the diagram.

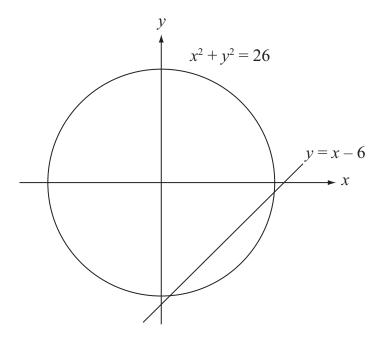


The angles from X and Y to the aircraft are 50° and 35° respectively. The aircraft must land as quickly as possible. How much closer is X than Y from A?

Show all working.



Answer _____ km [4]



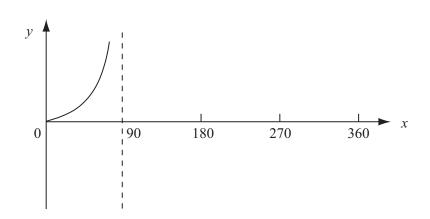
(a) Show that the x co-ordinates of the points of intersection of the line with the circle can be found from the solutions to the equation $x^2 - 6x + 5 = 0$

[3]

(b) Hence find the co-ordinates of the points of intersection of the line and the circle.

Answer (____,___) (____,___) [3]

7 (a) Complete this sketch for $y = \tan x^{\circ}$ for $0 \le x \le 360$



[1]

Examiner Only

(b) Solve the equation

$$3 \tan x^{\circ} = 4$$
 for $0 \le x < 360$

Answer _____ [2]

63	39	92
	63	639

8 The table shows information about 600 workers in a factory.

Age, a years	Number of Males	Number of Females
$20 \le a < 30$	99	26
$30 \le a < 40$	142	48
$40 \le a < 50$	124	64
50 ≤ <i>a</i> < 60	55	22
$60 \le a < 70$	20	0

The manager wants to carry out a survey of the workers' views on the workplace. He decides to choose a sample of 80 workers to take part in the survey.

(a) From an alphabetical list of workers' names, he selects every 5th name until he has 80 names.

Explain why this may not produce a fair sample.

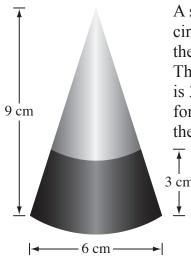
Answer _____

(b) If the manager decides to use a stratified sample, how many males aged under 40 should be in his sample of 80 workers?

Answer [2]

Answer _____ [4]

10



A solid paper weight is made in the shape of a right circular cone. Its height is 9 cm and the diameter of the base is 6 cm.

Examiner Only

The top section is glass and the base section, which is 3 cm high, is made of metal which weighs 14 g for each cubic centimetre. Calculate the weight of the metal in the base.

r	each cubic centimetre.	Calculate t
e	metal in the base.	
n		

Answer		g	[5	[]
--------	--	---	----	----

THIS IS THE END OF THE QUESTION PAPER

6392
0372

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.