



General Certificate of Secondary Education
2010

Mathematics

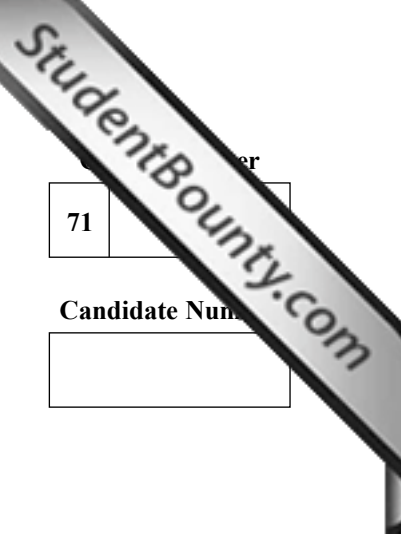


Module N3 Paper 1
(Non-calculator)
Higher Tier
[GMN31]

TUESDAY 1 JUNE
9.15 am – 10.15 am



GMN31



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71	
Candidate Number	
<input type="text"/>	

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.

You **must not** use a calculator for this paper.

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.

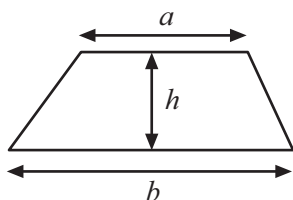
You should have a ruler, compasses, set-square and protractor.

The Formula Sheet is on page 2.

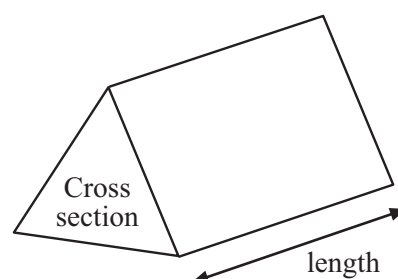
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
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12	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section \times length

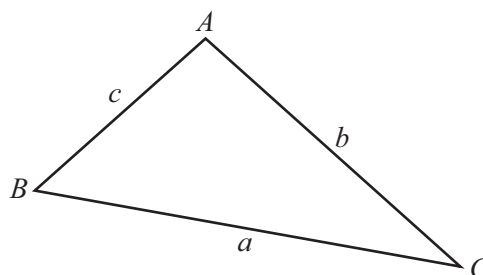


In any triangle ABC

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

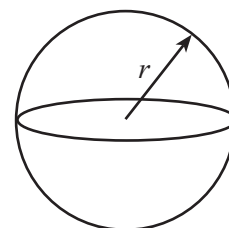
Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



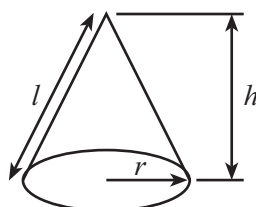
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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



Quadratic equation:

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

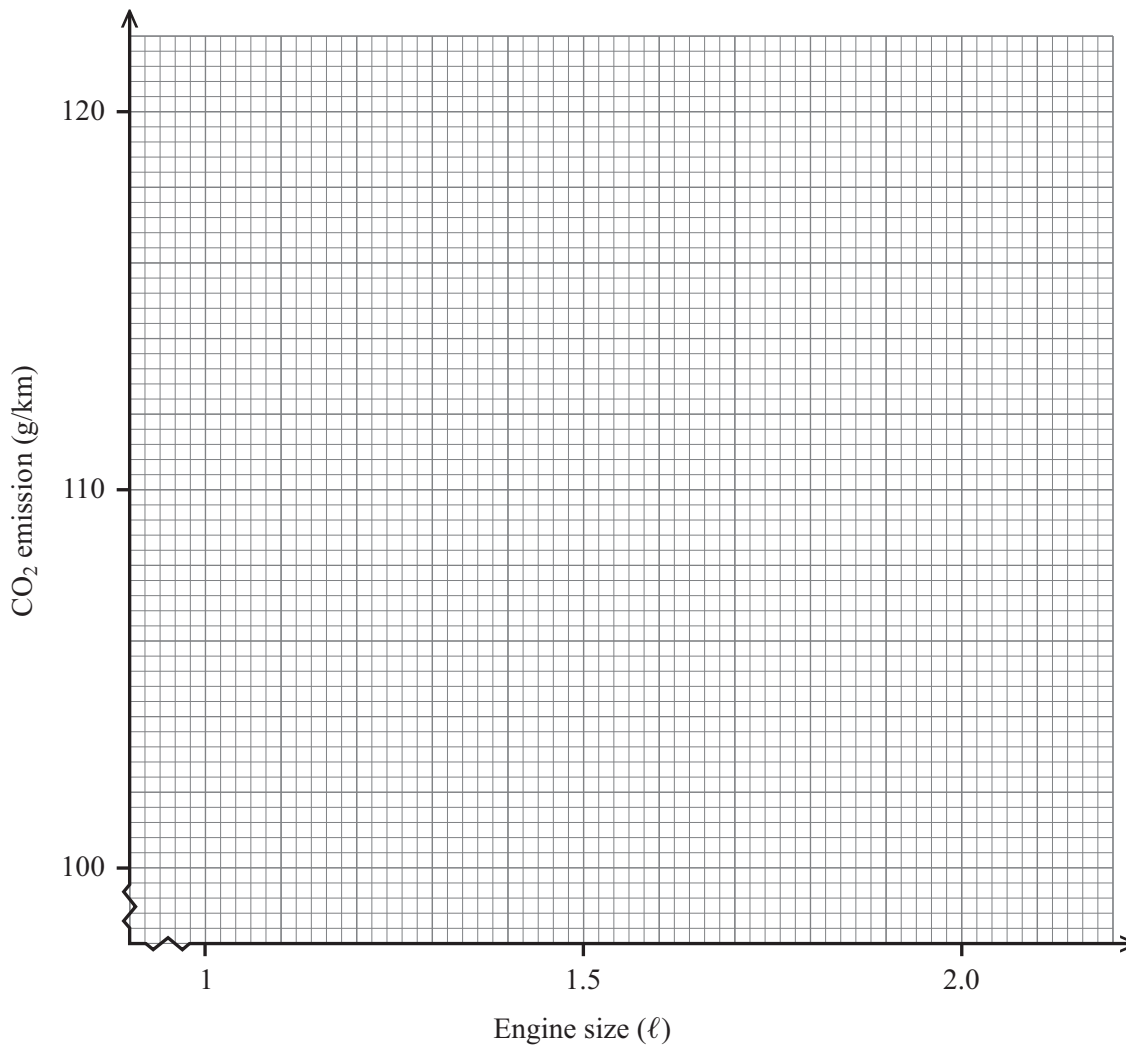
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

BLANK PAGE
(Questions start overleaf)

- 1 (a) Seven cars were tested for their CO₂ emission value.
Draw a scatter diagram, plotting engine size against CO₂ emission.

Make	Model	Engine size (ℓ)	CO ₂ emission (g/km)
Audi	A3	1.9	118
BMW	1 Series	2.0	120
Citroën	C1	1.4	109
Ford	Fiesta	1.4	110
Ford	Focus	1.6	115
Seat	Ibiza	1.4	100
Volkswagen	Golf	1.9	119

[2]



- (b) One of the results appears to be different from the others. Which car is it?

_____ [1]

Examiner Only	
Marks	Remark

(c) Use the rest of the results to draw a line of best fit. [1]

(d) Use your line of best fit to estimate the CO₂ emission value for a Fiat with engine size 1.3l.

Answer _____ g/km [1]

Examiner Only	
Marks	Remark

- 2 In a class there are 18 girls and 12 boys.
Six of the girls wear glasses and three of the boys wear glasses.
What percentage of the class wear glasses?

Examiner Only

Marks Remark

Answer _____% [3]

- 3 (a) Write down the first three terms of the sequence where the n th term is $n^2 + 2$

Answer _____, _____, _____ [2]

- (b) Find the n th term of the sequence

2, 6, 10, 14, 18,

Answer _____ [2]

- 4 (a) Change 2.6 m^2 into cm^2 .

Answer _____ cm^2 [2]

- (b) A bag of coal weighs 14 kg, correct to the nearest kg.
Write down the smallest weight the bag of coal could be.

Answer _____ kg [1]

5

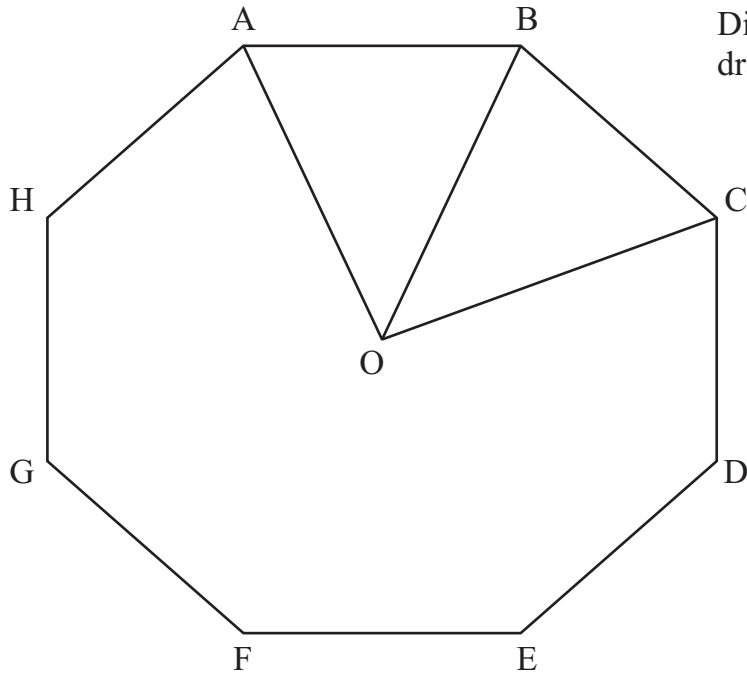


Diagram not
drawn accurately

ABCDEFGH is a regular octagon.

(a) Calculate the size of the angle AOB.

Answer _____° [2]

(b) Hence, or otherwise, calculate the size of the interior angle ABC.

Answer _____° [2]

Examiner Only	
Marks	Remark

6 Expand and simplify $(x - 1)(x + 7)$

Examiner Only

Marks Remark

Answer _____ [2]

7 Calculate the LCM (lowest common multiple) of 54 and 60

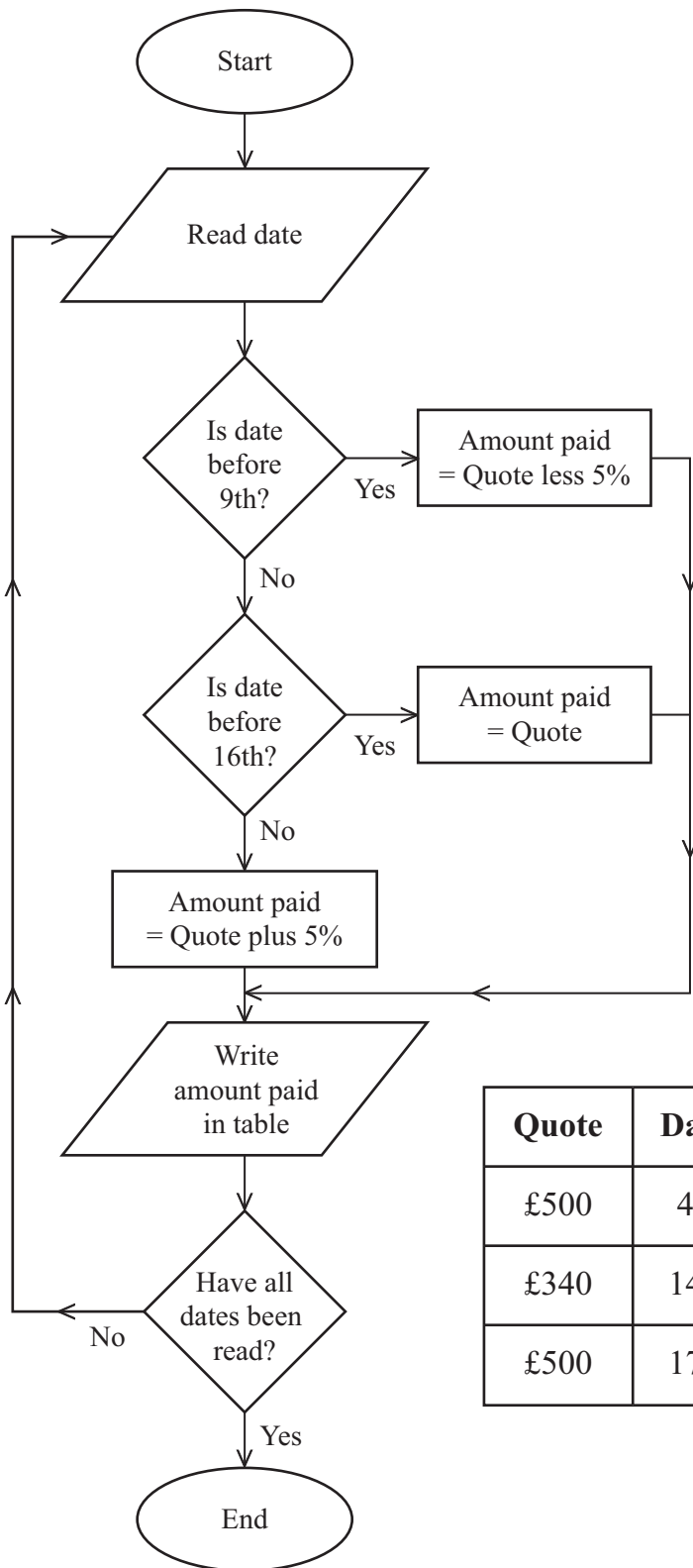
Answer _____ [3]

8 Jason bought four apples at x pence each and four cans of cola at $2x$ pence each.
He got £1.28 change from £5
Write down an equation in terms of x and solve it to find the value of x .

Answer $x =$ _____ [4]

- 9 “OILCO” delivers heating oil to three customers on Monday 2 February. Each customer is quoted a price, but the amount they actually pay depends on the date they pay. Use the flow chart to complete the table.

Examiner Only	
Marks	Remark



Quote	Date	Amount paid
£500	4th	
£340	14th	
£500	17th	

[3]

10 Solve the equation $\frac{4x + 3}{10} + \frac{6x - 5}{5} = \frac{13}{2}$

Examiner Only	
Marks	Remark

Answer $x =$ _____ [4]

11 (a) Find the equation of the line passing through the points (0, 1) and (2, 9).

Answer _____ [3]

(b) Find the exact length of the line from (4, -7) to (-1, 5).

Answer _____ [3]

12 Calculate $6\frac{1}{8} \div 2\frac{1}{3}$

Give your answer as a mixed number.

Answer _____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER
