



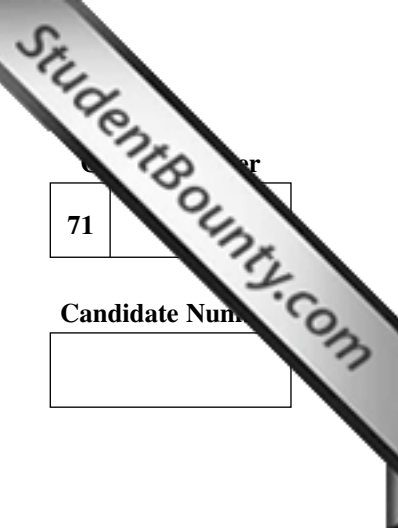
General Certificate of Secondary Education  
January 2009

## Mathematics



Module N6 Paper 2  
**(With calculator)**  
Higher Tier  
[GMN62]

WEDNESDAY 14 JANUARY  
**3.00 pm – 4.15 pm**



71

Candidate Number

### TIME

1 hour 15 minutes.

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

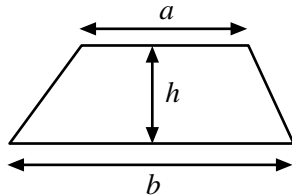
### INFORMATION FOR CANDIDATES

The total mark for this paper is 56.  
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.

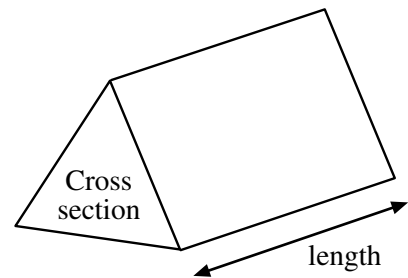
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
<b>Total Marks</b>	

# Formula Sheet

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



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

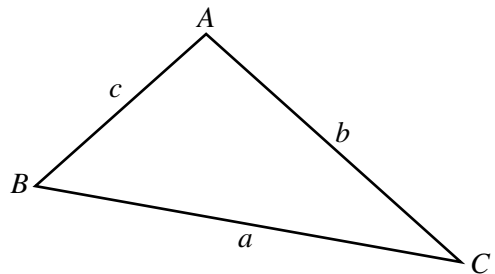


**In any triangle ABC**

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

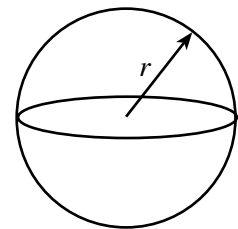
**Sine rule:**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



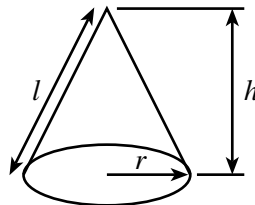
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

1 Rearrange  $y + 5 = 7 - x$  to make  $x$  the subject.

Answer  $x =$  \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark





3 (a) Complete the table for the graph of  $y = 5 - x^2$

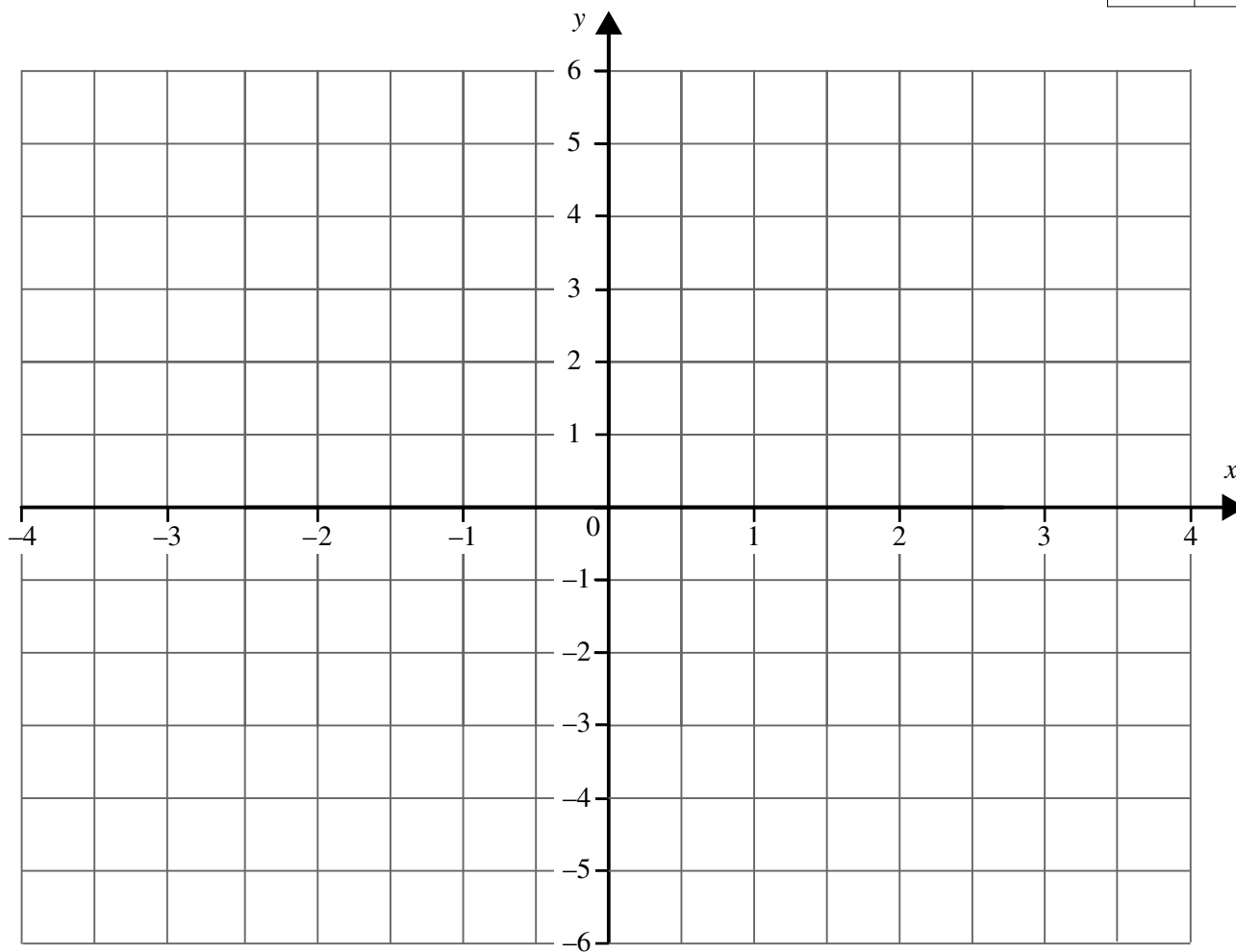
$x$	-3	-2	-1	0	1	2
$y$	-4		4	5	4	

[2]

(b) Hence draw the graph on the grid below.

[2]

Examiner Only	
Marks	Remark



- 4 Which of 'always odd', 'always even', 'could be odd or even' describes the number  $4n - 3$ ? ( $n$  is an integer)

**Explain your answer.**

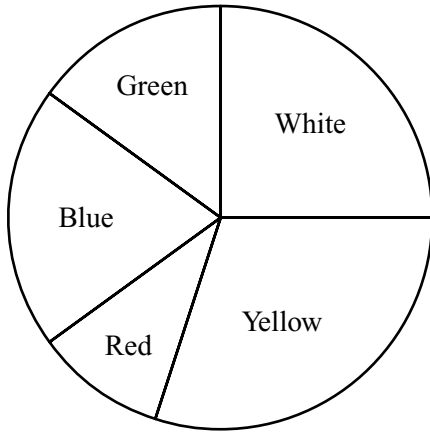
Answer \_\_\_\_\_

because \_\_\_\_\_

\_\_\_\_\_ [2]

Examiner Only

Marks Remark



A spinner can land on one of 5 colours. The probability of the spinner landing on four of the colours is given in the table below.

Colour	Red	Blue	White	Yellow	Green
Probability	0.1		0.25	0.3	0.15

(a) What is the probability that the spinner will land on blue?

Answer \_\_\_\_\_ [2]

The spinner is spun 600 times.

(b) How many times would you expect the spinner to land on white or green?

Answer \_\_\_\_\_ [2]

(c) The probability that a contestant wins £100, £200, £500 or £1000 in a TV quiz show is given in the table below.

Winnings	£100	£200	£500	£1000
Probability	0.3	0.35	0.2	0.15

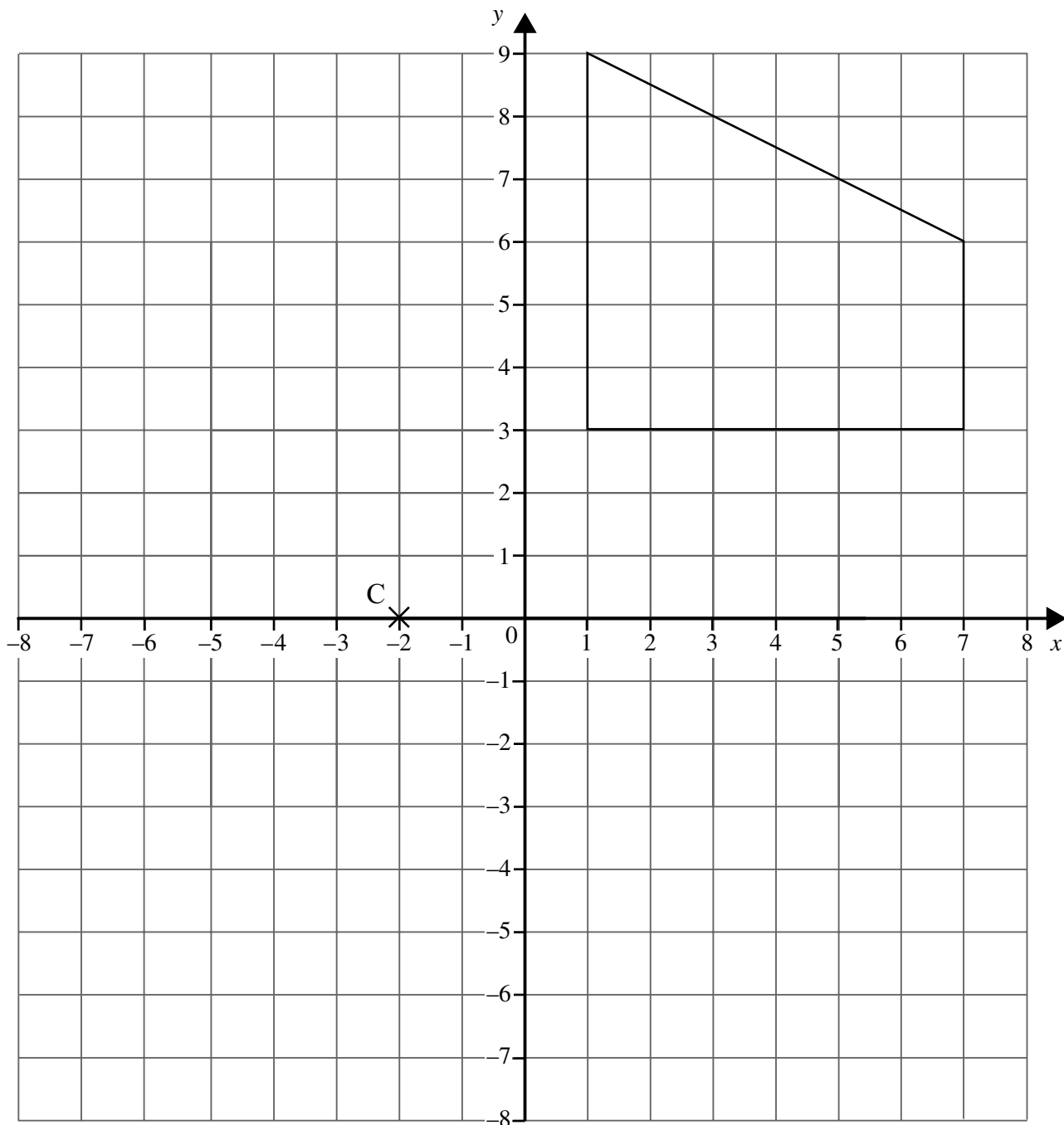
Find the probability that a contestant selected at random will win at least £500.

Answer \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark



- 6 Enlarge the shape on the grid by scale factor  $\frac{1}{3}$  and centre C.

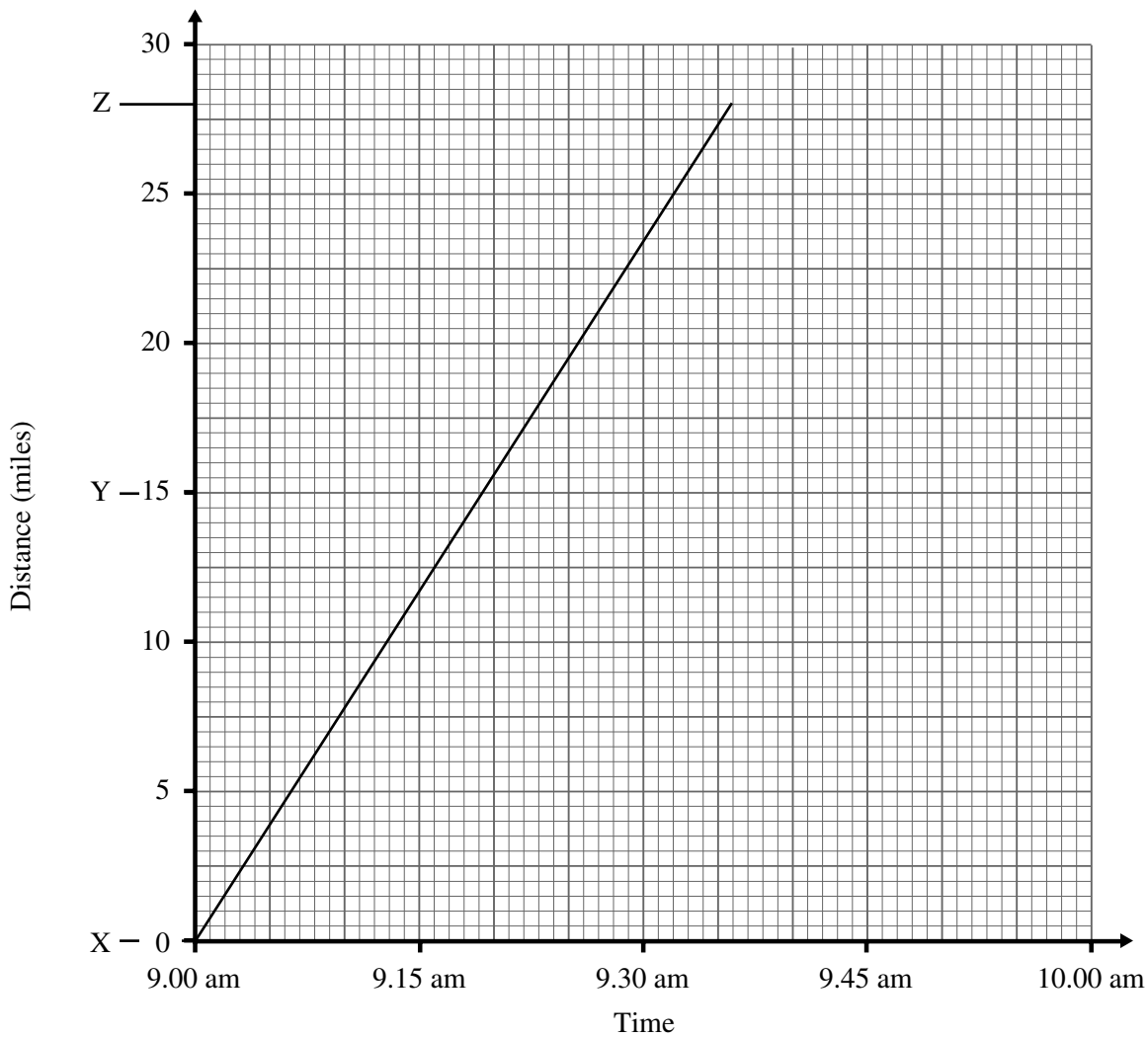


[2]

Examiner Only	
Marks	Remark



- 9 A car travels from town X to town Z passing through town Y, 15 miles from X. The graph shows its journey.



Another car leaves town Z at 9.10 am and travels to town Y arriving at 9.30 am. It stops there for 3 minutes and then travels to town X at an average speed of 45 mph.

- (a) Show the journey of this car on the graph as it travels from town Z to town X. [3]
- (b) At what time do the cars pass each other?

Answer \_\_\_\_\_ am [1]

Examiner Only	
Marks	Remark

- 10 (a) Calculate the area of the trapezium ABCD.  
Give your answer to an appropriate degree of accuracy.

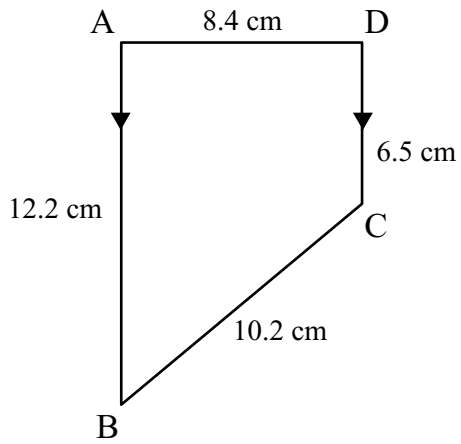
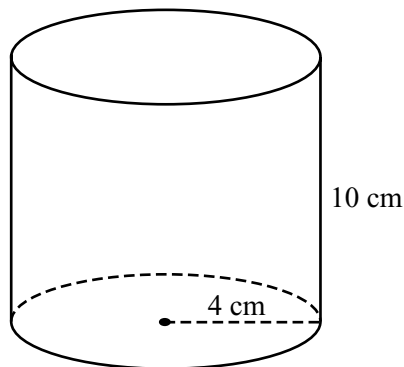


Diagram not drawn accurately

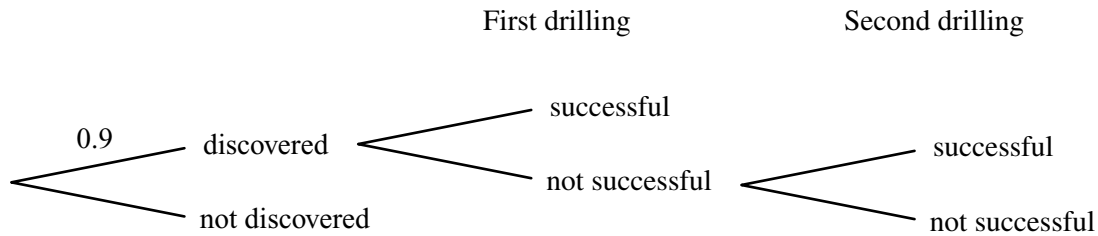
Answer \_\_\_\_\_  $\text{cm}^2$  [3]

- (b) Calculate the curved surface area of the cylinder.



Answer \_\_\_\_\_  $\text{cm}^2$  [2]

Examiner Only	
Marks	Remark



The probability of a famous oil prospector discovering oil in a region of the North Sea is 0.9

If she discovers oil, the chance of pumping oil to the surface on the first drilling is 0.7

If the first drilling fails, the chance of successfully pumping oil to the surface on the second drilling is 0.4

If the second drilling is unsuccessful, the drilling is abandoned as the process is too expensive.

(a) Complete the tree diagram for these events. [2]

(b) What is the probability of discovering oil and pumping it to the surface on the first drilling?

Answer \_\_\_\_\_ [2]

(c) What is the probability that oil will be discovered and pumped to the surface?

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

(d) What is the probability that no oil will be pumped to the surface?

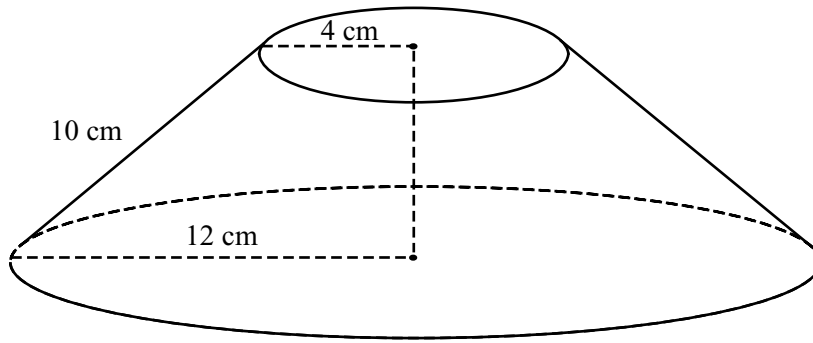
Answer \_\_\_\_\_ [1]

Examiner Only	
Marks	Remark

[Turn over



14 Calculate the curved surface area of the frustum of a solid cone.



Answer \_\_\_\_\_  $\text{cm}^2$  [4]

Examiner Only	
Marks	Remark

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

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