



Rewarding Learning

General Certificate of Secondary Education  
January 2013

Centre Number

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Candidate Number

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## Mathematics

Unit T2

(With calculator)



Foundation Tier

[GMT21]



\*GMT21\*

FRIDAY 11 JANUARY 9.15 am–10.45 am

### TIME

1 hour 30 minutes.

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided. Do not write outside the box, around each page, on blank pages or tracing paper.**

Complete in blue or black ink only. **Do not write in pencil or with a gel pen.**

Answer **all twenty-seven** questions.

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

You **may** use a calculator for this paper.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in **questions 4, 7 and 10.**

You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is overleaf.

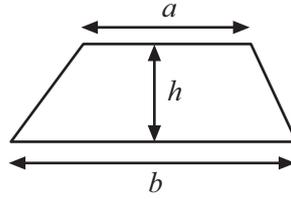
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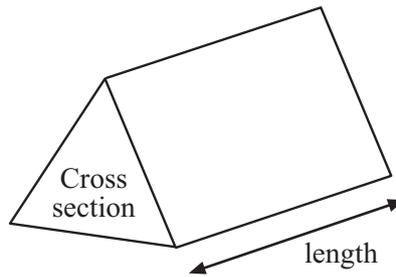
\*28GMT2101\*

# Formula Sheet

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



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



1 (a) Write down the next two prime numbers after 43

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

(b) Find the cube root of 125

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

Examiner Only

Marks	Remark
Total Question 1	

2 In the diagram of the triangle ABC below,  $AB = AC$ .

Angle  $ABC = 49^\circ$ .

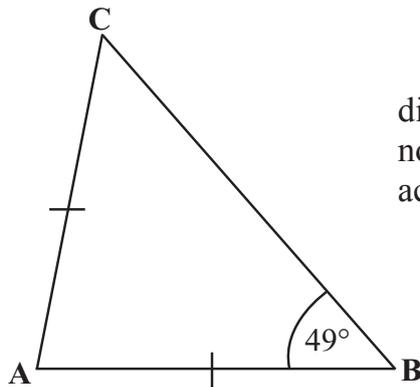


diagram  
not drawn  
accurately

(a) Write down the size of the angle BCA.

Answer \_\_\_\_\_° [1]

(b) Calculate the size of the angle BAC.

Answer \_\_\_\_\_° [2]

Total Question 2

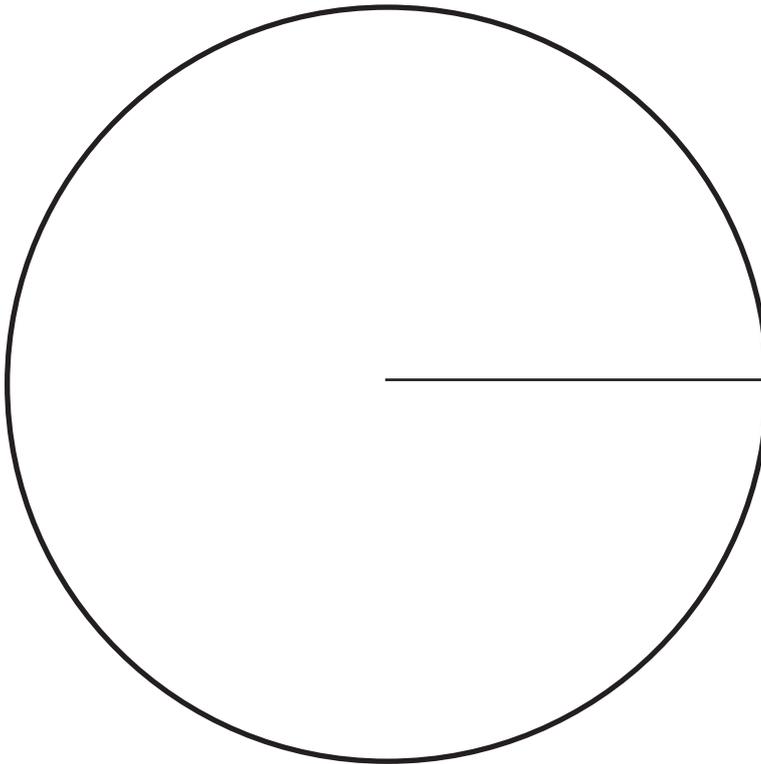
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- 3 The table below shows the number of different types of birds on a lake.

BIRD	TERNs	WADERS	GEESE	DUCKs	SWANs
NUMBER	50	20	30	10	10
ANGLE					

Draw a clearly labelled pie chart to show the number of different types of birds.



[4]

Examiner Only	
Marks	Remark
Total Question 3	



4 Quality of written communication will be assessed in this question.  
Show your working.



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A TV costs £265  
Sam pays a deposit of £85 for this TV.  
He then pays £15 each month.  
How many complete months will it take before he has paid for the TV?  
Explain your working clearly, using words and numbers.

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

Examiner Only	
Marks	Remark
Total Question 4	

[Turn over





6 (a) Calculate  $3^2 \times 8^3$

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

(b) Calculate  $3.6^2 + \sqrt{2.89}$

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

(c) Write down a cube number between 20 and 40

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

Examiner Only

Marks Remark

Total Question 6

[Turn over

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\*28GMT2107\*

- 7 **Quality of written communication will be assessed in this question.**  
**Show your working.**

The times, in minutes, taken by 15 women to complete a crossword are shown in this stem and leaf diagram.

	WOMEN
1	2 3 3 5 7 7 8 9
2	4 6 8 8
3	5 6 8

Key 2 | 4 means 24 minutes

- (a) Find the range of the women's times.

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

- (b) Find the median of the women's times.

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

The women's times were then compared with the times of 15 men in this new stem and leaf diagram.

	WOMEN		MEN
1	2 3 3 5 7 7 8 9	1	2 4 4 6
2	4 6 8 8	2	1 3 3 3 9
3	5 6 8	3	7 8
4		4	3 4 5 6

Key 2 | 4 means 24 minutes

- (c) The men say that they were quicker at completing the crossword. Do you agree? Give a reason for your answer.

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

Examiner Only	
Marks	Remark
Total Question 7	



8 (a) Simplify  $3x - 2y - x + 6y$

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

(b) Expand  $4(3t - 1)$

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

(c) Solve  $\frac{y}{4} = 8$

Answer  $y =$  \_\_\_\_\_ [1]

(d) Solve  $3p - 2 = 16$

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

Examiner Only

Marks Remark

Total Question 8

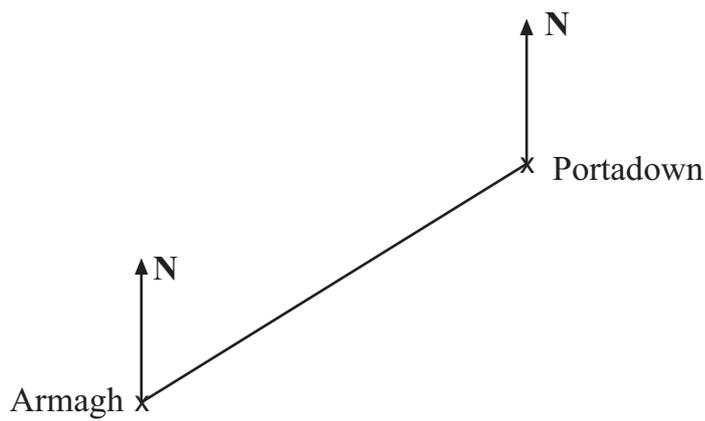
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\*28GMT2109\*

- 9 The diagram below represents the positions of Armagh and Portadown.



Scale 1 cm to 3 km

- (a) What is the bearing of Portadown from Armagh?

Answer \_\_\_\_\_ ° [1]

- (b) Calculate the actual distance from Armagh to Portadown.

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

- (c) The city of Newry is 27 km from Armagh on a bearing of  $130^\circ$ .  
Mark clearly the position of Newry on the diagram above. [2]

Examiner Only	
Marks	Remark
Total Question 9	



**10** Quality of written communication will be assessed in this question.  
Show your working.

The signs below showed the price of the same table in two different stores.

<p><b>Super Price</b></p> <p><b>£640</b></p> <p><b>15% off marked price</b></p>	<p><b>Right Price</b></p> <p><b>£460</b></p> <p><b>plus</b></p> <p><b>20% VAT</b></p>
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Which store had the cheaper price for the table?

**Explain your answer.**

Answer \_\_\_\_\_ [6]

Examiner Only

Marks	Remark
Total Question 10	

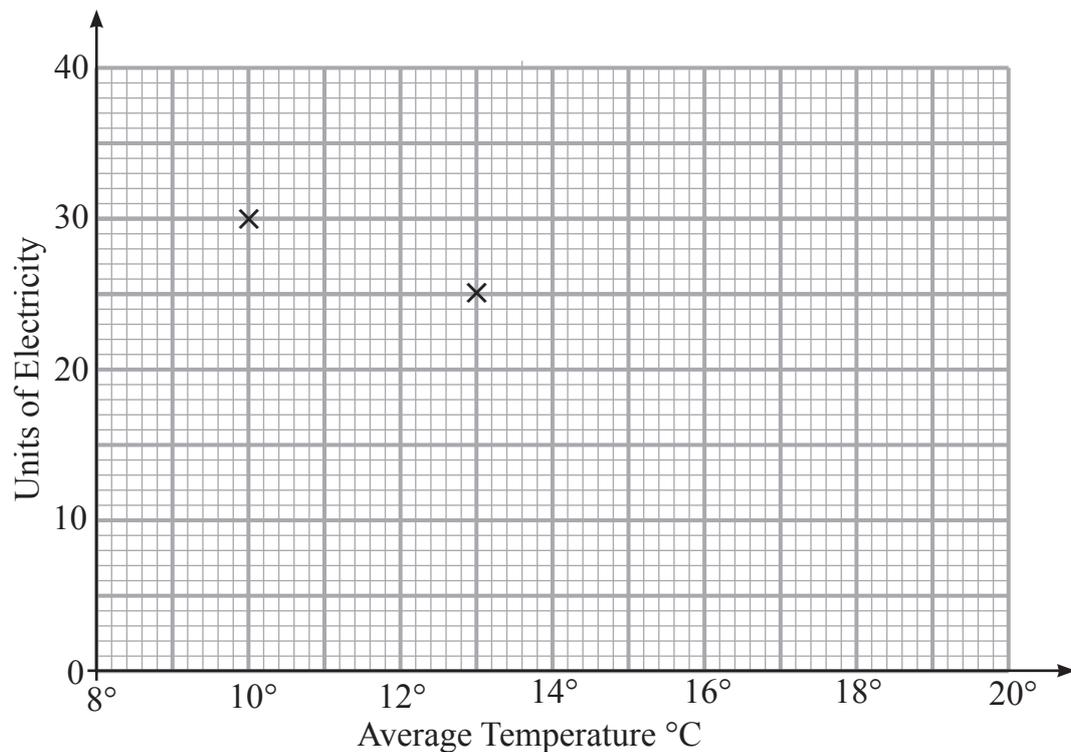
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- 11 The table shows the number of units of electricity used in heating a greenhouse on eight different days and the average temperature for each day.

Average Temperature ( $^{\circ}\text{C}$ )	10	13	15	12	14	20	17	19
Units of Electricity	30	25	22	26	20	14	17	15

- (a) Complete the scatter diagram shown (the first two points have been plotted for you).



[2]

- (b) Describe the correlation between Average Temperature and Units of Electricity.

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

- (c) Draw a line of best fit on the scatter diagram.

[1]

- (d) Use your line of best fit to estimate how many units of electricity were used when the temperature was  $16^{\circ}\text{C}$ .

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

Examiner Only

Marks Remark

Total Question 11



12 (a) Write down the next two numbers in the sequence

18, 16, 12, 6, .....

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

(b) Write down the  $n$ th term for the sequence

2, 8, 14, 20, .....

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

Examiner Only

Marks Remark

Total Question 12

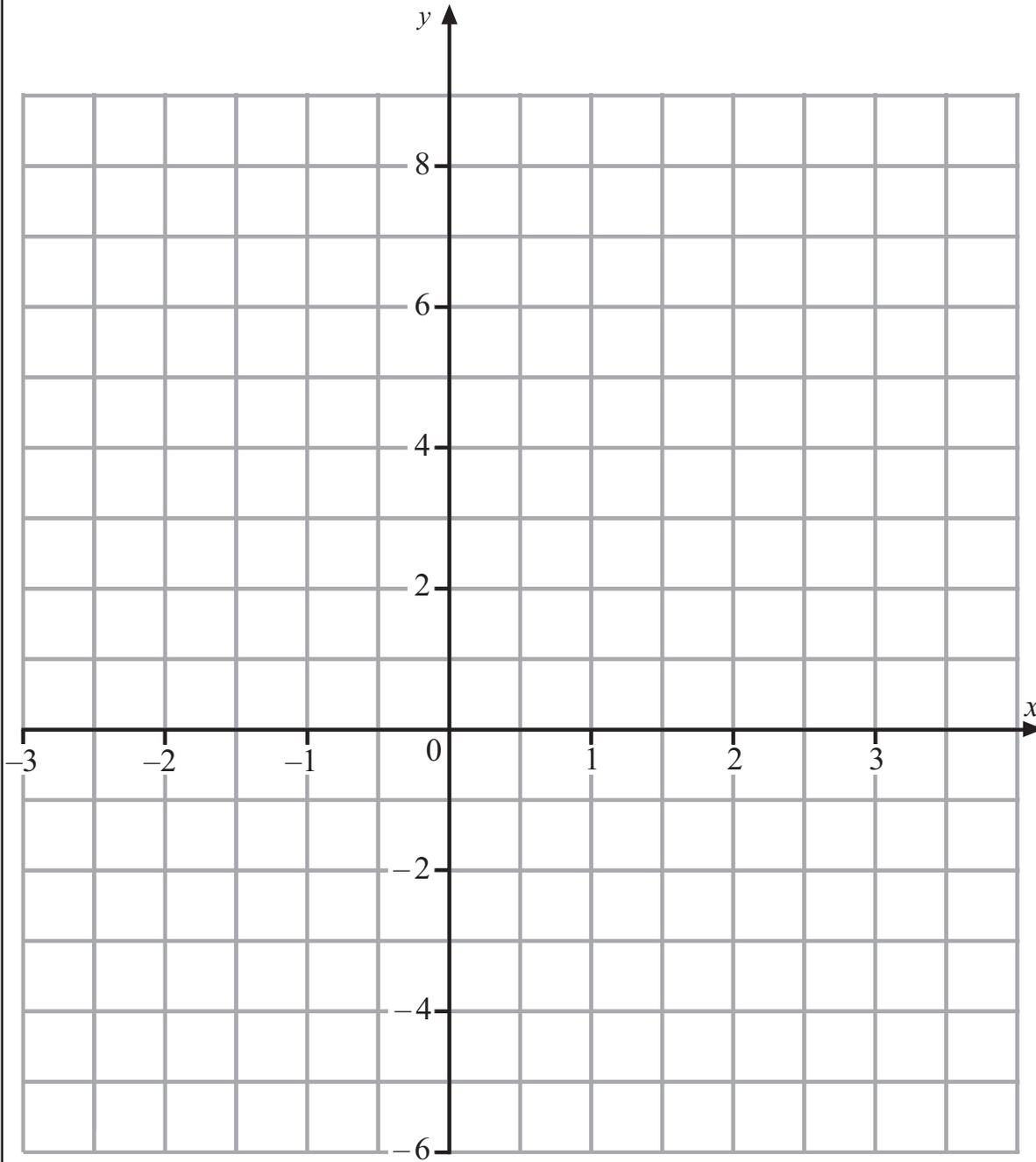
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\*28GMT2113\*

13 Draw the graph of  $y = 3 - 2x$  on the grid below.



[3]

Examiner Only	
Marks	Remark
Total Question 13	



14 A circle has a radius of 11.7 cm.

Work out the circumference of the circle.

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

Examiner Only

Marks	Remark
Total Question 14	

15 (a) Which of the following fractions is nearest in value to  $\frac{1}{4}$ ?

$$\frac{3}{10} \quad \frac{7}{20} \quad \frac{4}{15} \quad \frac{17}{60}$$

Show your working.

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

(b) Write down the meaning of  $0.\dot{5}\dot{7}$

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

Total Question 15

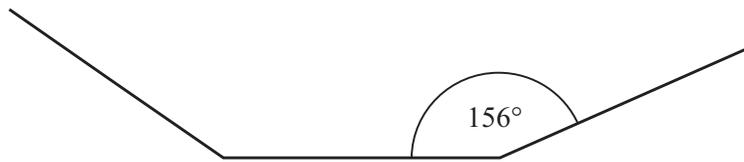
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17 The diagram below shows part of a regular polygon.

Each interior angle is  $156^\circ$ .



(a) Calculate the size of the exterior angle of the polygon.

Answer \_\_\_\_\_  $^\circ$  [2]

(b) Calculate the number of sides of the polygon.

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

Examiner Only

Marks	Remark
Total Question 17	

Total Question 17

[Turn over





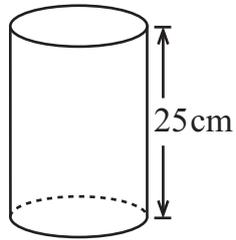


- 20 Naomi used  $3\frac{3}{4}$  cans of paint for the living room and  $1\frac{2}{3}$  cans for the kitchen. Show how to work out the total amount of paint used without using a calculator.

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

Examiner Only	
Marks	Remark
Total Question 20	

21



The cylinder above has a capacity of 3 litres. It is 25 cm high.

Find the radius of the cylinder.

Answer \_\_\_\_\_ cm [4]

Total Question 21	



- 22 The two points A(6, -1) and B(-4, 6) are joined by a straight line.

Work out the co-ordinates of the midpoint of the line AB.

Answer (\_\_\_\_\_, \_\_\_\_\_) [2]

Examiner Only	
Marks	Remark
Total Question 22	
Total Question 23	

- 23 In a class there are 16 girls and 14 boys.  
Thirteen of the girls are right-handed and eleven of the boys are right-handed.  
What percentage of the class are right-handed?

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

[Turn over





26 One solution of  $x^3 - 2x = 30$  lies between 3 and 4

Use the method of **trial and improvement** to find this solution correct to one decimal place.

**Show all your working.**

Answer  $x =$  \_\_\_\_\_ [3]

Examiner Only	
Marks	Remark
Total Question 26	

[Turn over





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<b>Total Marks</b>	
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Examiner Number

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