



General Certificate of Secondary Education  
2015

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

# Mathematics

Unit T6 Paper 2  
(With calculator)  
Higher Tier



[GMT62]

\*GMT62\*

**TUESDAY 26 MAY, 3.00pm–4.15pm**

## 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.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page, on blank pages or tracing paper.**

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

Answer **all fourteen** 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 50.

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 Question 2.

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

The Formula Sheet is on page 2.

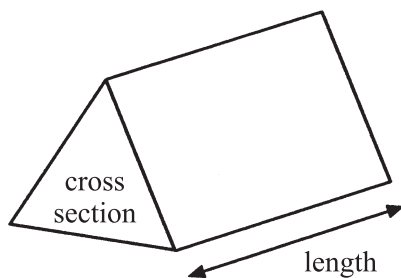
9470



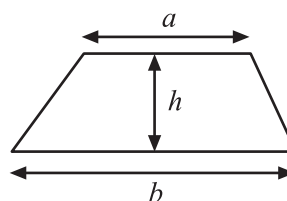
\*16GMT6201\*

# Formula Sheet

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

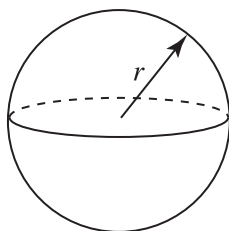


**Area of trapezium** =  $\frac{1}{2}(a+b)h$



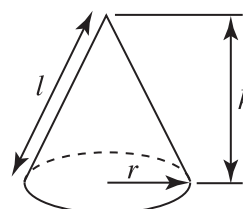
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

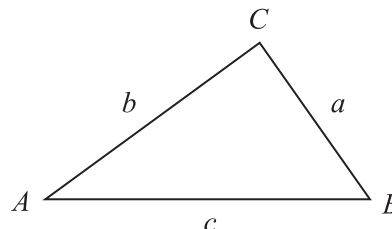


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

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



**In any triangle ABC**



## Quadratic Equation

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

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

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

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

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



1 Bobby the builder has nails of five different lengths in a jar.

The probability of a nail being a certain length is given in the table.

Length (mm)	20	24	30	36	44
Probability	0.15		0.2	0.25	0.35

(a) What is the probability of a nail being 24 mm long?

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

There are 60 nails in the jar.

(b) How many nails are longer than 30 mm?

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

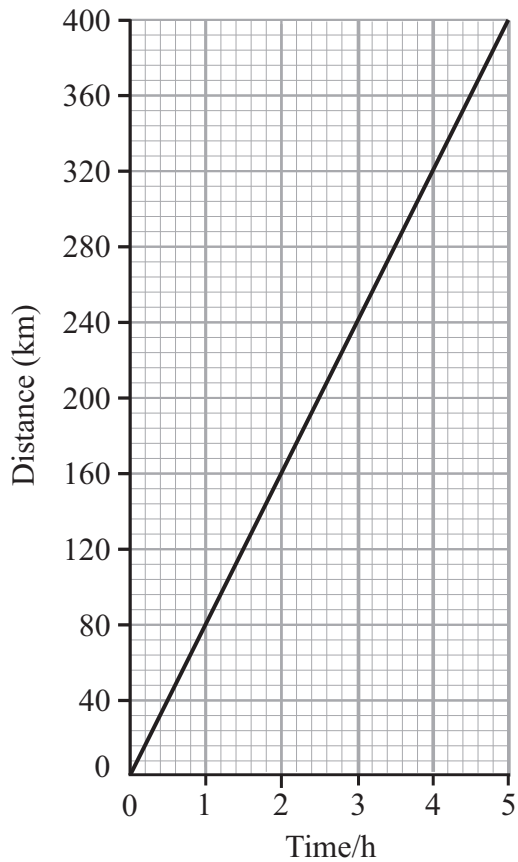
[Turn over



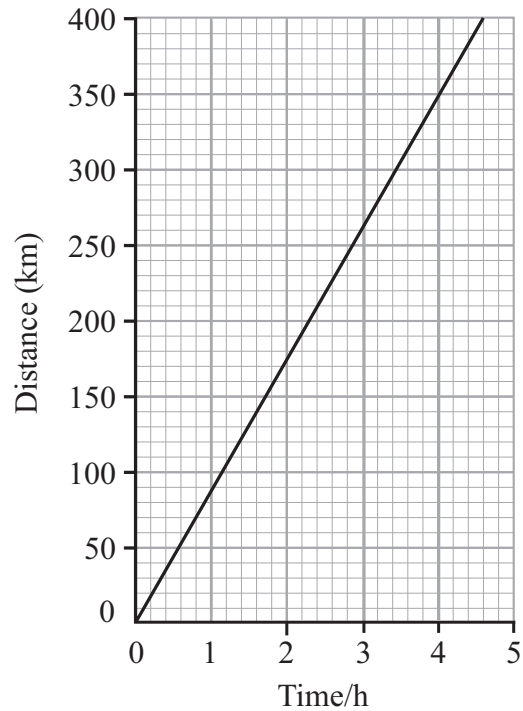
Quality of written communication will be assessed in this question.

2

**Train A**



**Train B**



The graphs show how two trains complete a 400 km journey.

Which of the trains A or B has the greater average speed?

Explain your answer clearly.

Train \_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[3]



3 Rewrite  $3y + 1 = 5y - x$  to make  $x$  the subject.

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

4  $n$  is an integer.

Which of the statements below describes the number  $(2n + 1)^2$ ?

Explain your answer.

“always even”

“always odd”

“could be even or odd”

Answer \_\_\_\_\_

because \_\_\_\_\_

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

[Turn over



- 5 Jane works in a jewellery shop and earns £7.75 per hour.  
She works eight hours a day.  
For each Gem product she sells, Jane receives a bonus of £5.25  
The manager noted that in the previous 40 working days Jane sold 5 Gem products.

Jane asks for advance payment of her next month's wages. The manager agrees. There are 24 working days in the next month. Calculate the amount the manager should pay her in advance, taking account of her previous performance.

Answer £ \_\_\_\_\_ [4]



6 (a) Solve  $4n + 3 > 28$

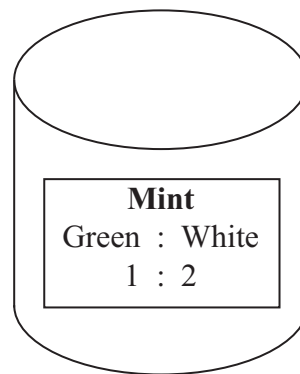
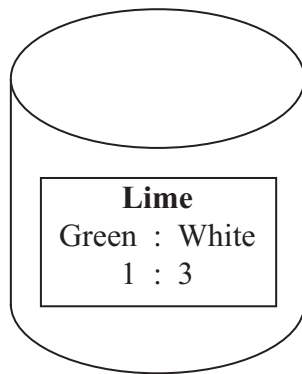
Answer \_\_\_\_\_ [2]

(b) Hence write down the smallest integer value to satisfy the inequality.

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



7 Green and white paint can be mixed in different ratios to make different shades.



Janet has 1.2 litres of Lime. How much extra green paint does she need to add to turn it into Mint?

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

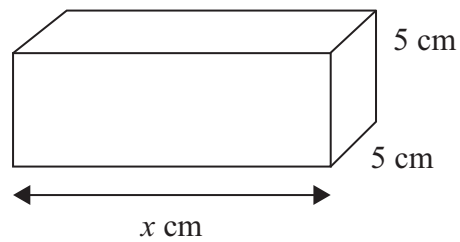
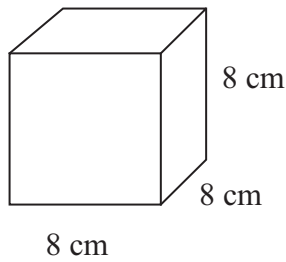




8 Simplify  $\frac{a^8 \times a^{-2}}{a^3}$

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

9



The surface area of a cube of side length 8 cm is the same as the surface area of the cuboid shown.

Find the value of the side marked  $x$  cm.

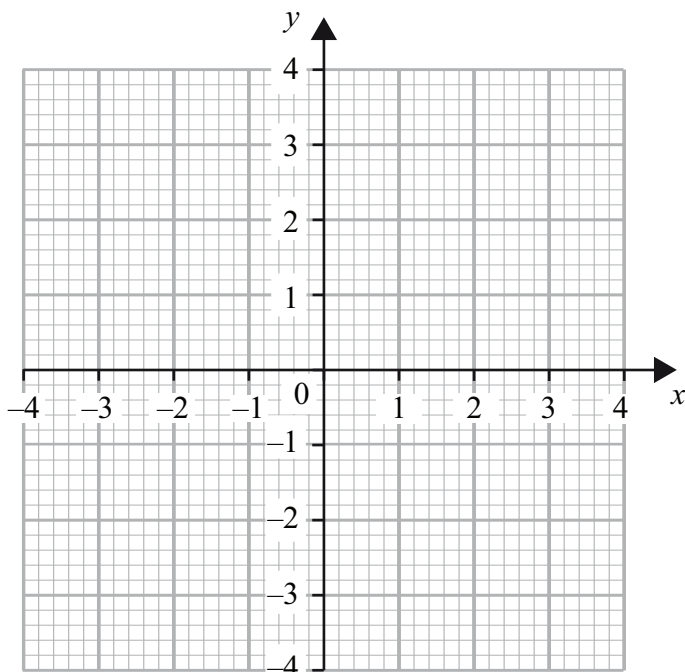
Answer \_\_\_\_\_ cm [4]

[Turn over



10 (a) Draw the graph of  $y = x^2 - x - 2$  for values of  $x$  from  $-2$  to  $3$

[2]



(b) (i) Write down the equation of the line of symmetry of the curve.

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

(ii) Hence **calculate** the minimum value of the curve.

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



11 The lengths of the edges of a cube are all increased by 10%.

By what percentage is the volume of the cube increased?

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

12 A metal cube made of lead is melted down to make 100 identical spherical weights with a radius of 2 cm.

Calculate the smallest **integer** side length for the cube.

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

[Turn over



13 Given that  $a(5x + 1) + b(2x - 3) \equiv 4x + 11$  work out the values of  $a$  and  $b$ .

**Show all your working clearly.**

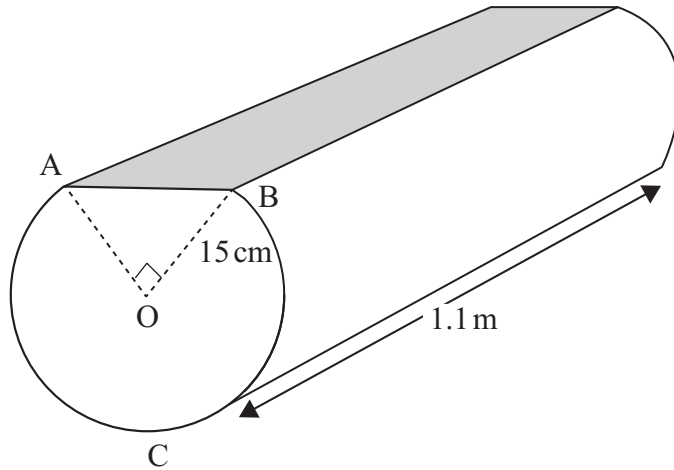
**A solution by trial and improvement will not be accepted.**

Answer  $a = \underline{\hspace{2cm}}$   $b = \underline{\hspace{2cm}}$  [5]



- 14 A cylindrical wooden log of length 1.1 m has been sliced along the upper end to leave a flat top with a uniform cross section as shown.

ACB is the arc of a circle of radius 15 cm. Angle  $AOB = 90^\circ$   
Calculate the remaining volume.



Answer \_\_\_\_\_  $\text{m}^3$  [5]



**BLANK PAGE**  
**DO NOT WRITE ON THIS PAGE**

9470



\*16GMT6214\*



**BLANK PAGE**  
**DO NOT WRITE ON THIS PAGE**

9470



\*16GMT6215\*

**DO NOT WRITE ON THIS PAGE**

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

<b>Total Marks</b>	
--------------------	--

Examiner Number

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.

