



Rewarding Learning

General Certificate of Secondary Education
2014

Centre Number

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Candidate Number

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Mathematics

Unit T6 Paper 1

(Non-calculator)

Higher Tier



ML

[GMT61]

FRIDAY 30 MAY, 1.30 pm–2.45 pm

TIME

1 hour 15 minutes, plus your additional time allowance.

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.

Complete in blue or black ink only.

Answer **all sixteen** 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 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.

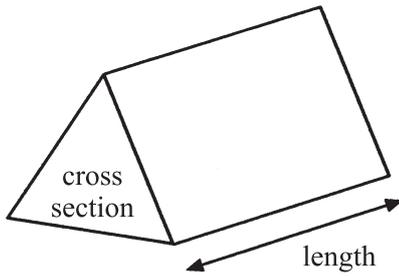
Quality of written communication will be assessed in **question 13**.

You should have a ruler, compasses and a protractor.

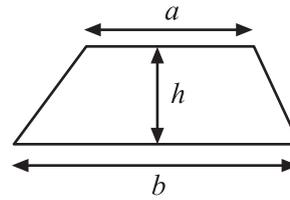
The Formula Sheet is on page 2.

Formula Sheet

Volume of prism = area of cross section \times length

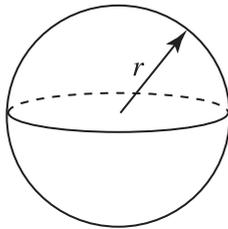


Area of trapezium = $\frac{1}{2}(a+b)h$



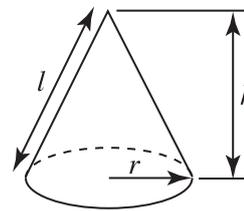
Volume of sphere = $\frac{4}{3}\pi r^3$

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

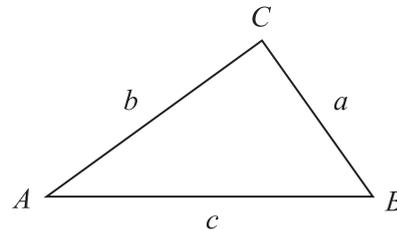


Volume of cone = $\frac{1}{3}\pi r^2 h$

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 Work out the value of $\frac{Q^2(4-R)}{3}$ when $Q = -3$ and $R = 6$

Answer _____ [3]

Examiner Only

Marks	Remark
Total Question 1	

2 (a) Given that $24 \times 640 = 15360$

write down the answer only to 2.4×64

Answer _____ [1]

(b) Given that $\frac{25600}{80} = 320$

write down the answer only to $\frac{2560}{8}$

Answer _____ [1]

Total Question 2

[Turn over

3 (a) Calculate $600 \div 0.2$

Answer _____ [2]

(b) Without working out the answer to 40×0.752 write down whether it will be greater or less than 40
Explain your answer clearly.

_____ because _____

_____ [2]

Examiner Only

Marks	Remark
Total Question 3	

4 Find the area of the shape below.

All lengths are in centimetres.

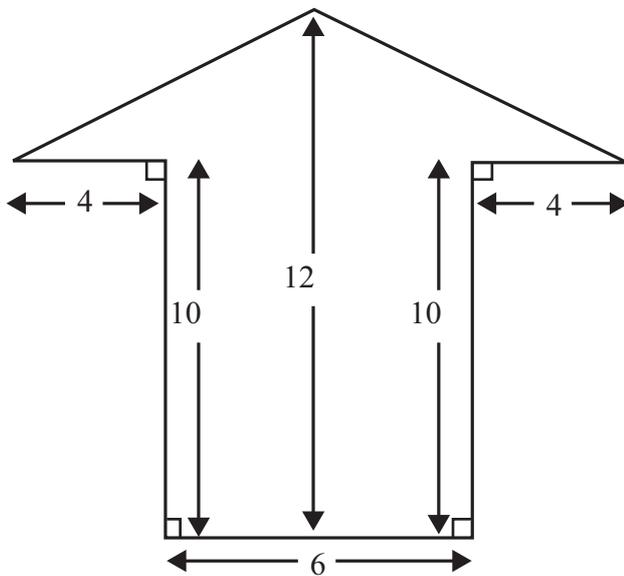
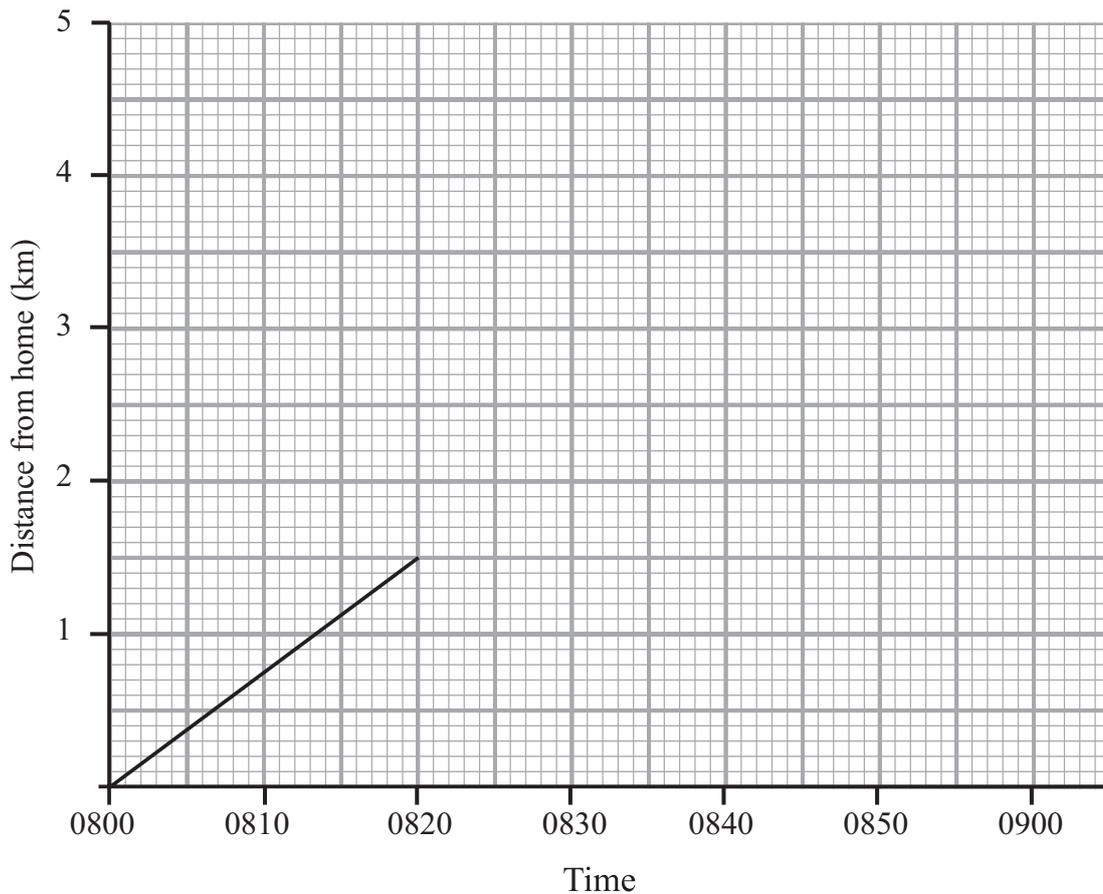


diagram not
drawn accurately

Answer _____ cm^2 [2]

Total Question 4	

- 5 Marcus leaves home at 0800 to walk to school. School begins at 0900. The distance – time graph shows part of his journey.



- (a) Work out his average speed for this part of the journey. Give your answer in kilometres per hour.

Answer _____ km/hr [2]

- (b) At 0820 Marcus stops at a shop for 10 minutes. He then completes his journey to school at 6 km/hr. He arrives in school 2 minutes before the 0900 bell. Complete the travel graph to illustrate his journey. [3]

- (c) Hence determine the distance from the shop to school.

Answer _____ km [2]

Examiner Only

Marks Remark

Total Question 5

[Turn over

6 The table shows some of the probabilities of when patients arrive for dental appointments.

Patient arrives	Probability
Early	0.1
Exactly on time	0.58
Late	
Not at all	0.06

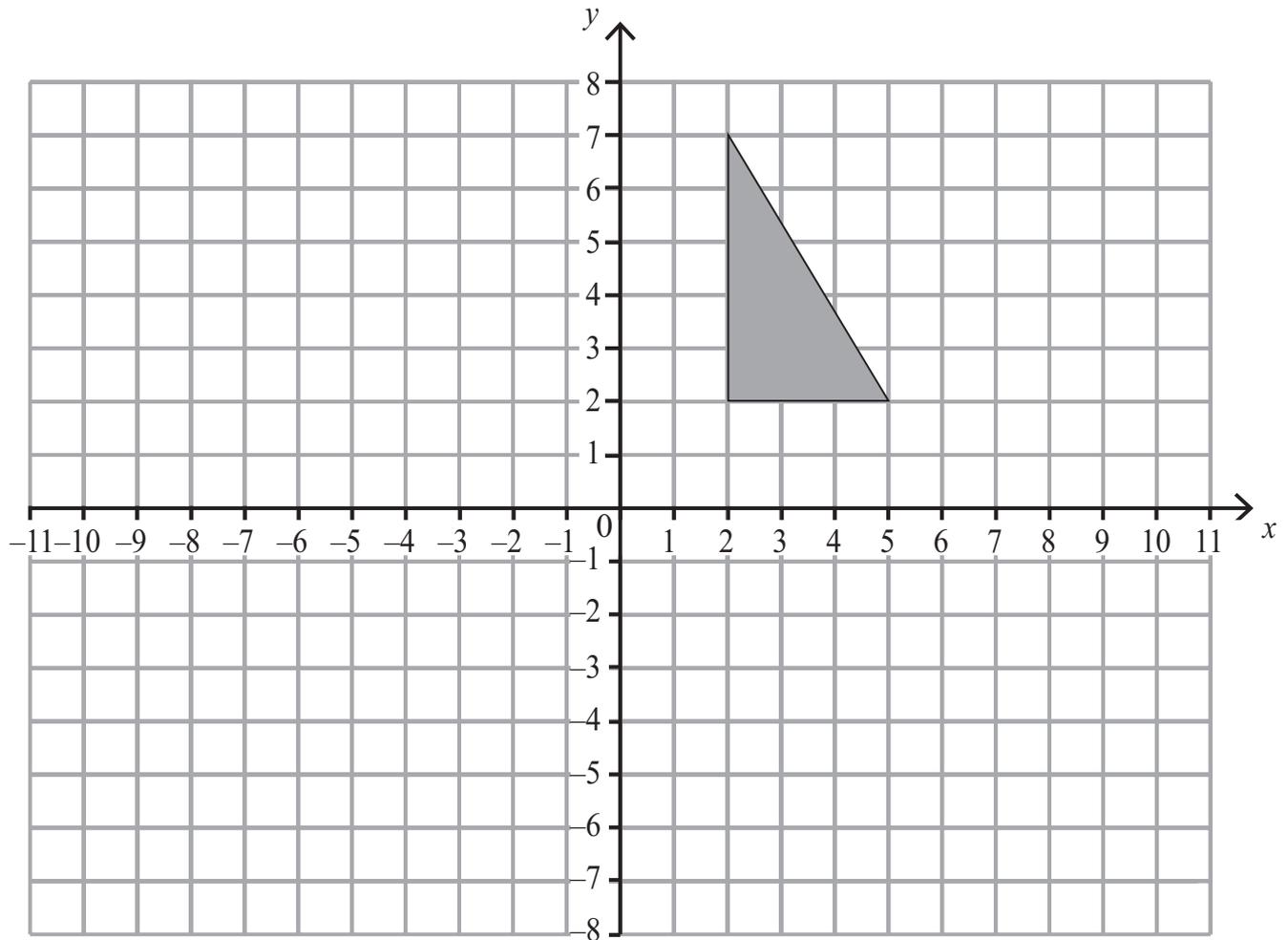
Calculate the probability that a patient

(a) is late, Answer _____ [2]

(b) arrives. Answer _____ [2]

Examiner Only	
Marks	Remark
Total Question 6	

7



Draw and shade the image of the triangle after a 90° anticlockwise rotation about the point $(-1, 1)$. [2]

Examiner Only	
Marks	Remark
Total Question 7	

[Turn over

10 Simplify

(a) $m^3 \times m^3$

Answer _____ [1]

(b) $\sqrt{\frac{\pi x^3}{9\pi x}}$

Answer _____ [2]

Examiner Only

Marks Remark

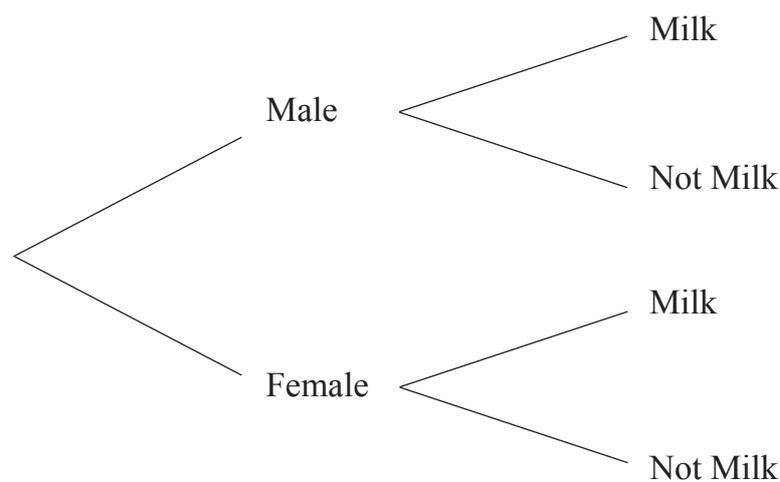
Total Question 10

11 Students in 6th Form were asked about the type of drink they chose most often at lunch.

	Water	Milk	Fizzy Drink	Total
Male	32	13	85	130
Female	16	30	74	120
Total	48	43	159	250

A student is selected at random from the 6th Form.

Use the information in the table to complete the probability tree diagram.



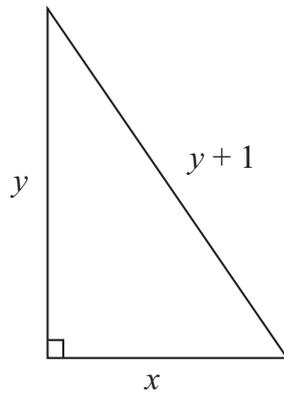
[3]

Total Question 11

[Turn over

Quality of written communication will be assessed in this question.

- 13 The right-angled triangle has sides x , y and $y + 1$ as shown, where x and y are integers.



Prove that x must be odd. Explain your working clearly.

[4]

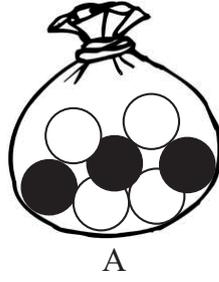
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Marks Remark

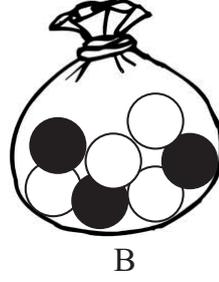
Total Question 13

[Turn over

14



A



B

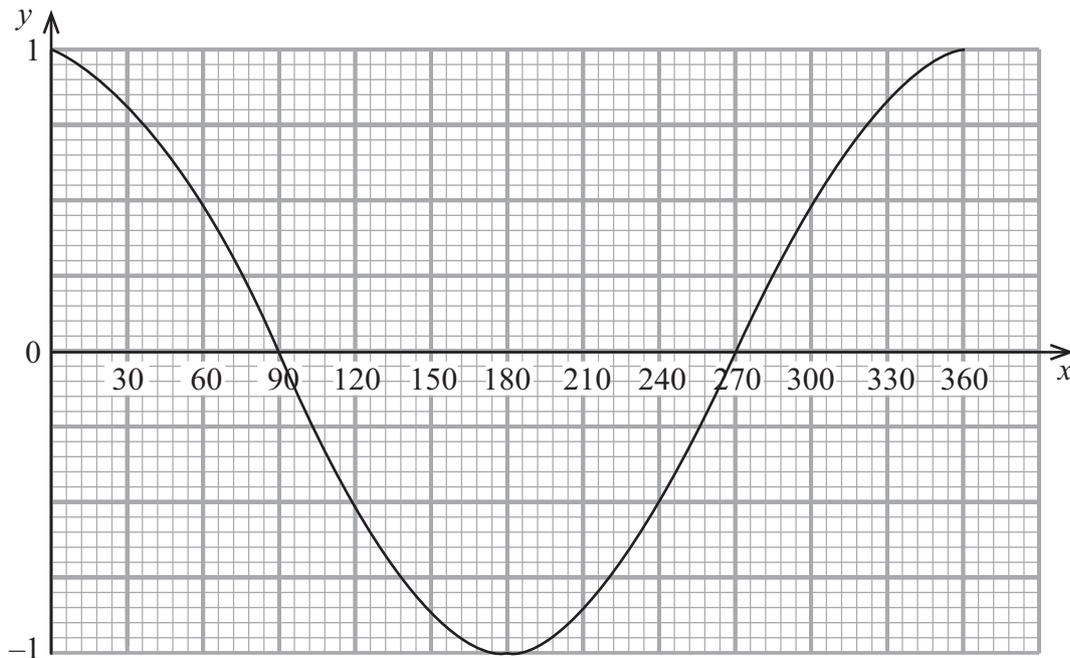
Two identical bags each contain seven balls. In each bag, four of the balls are white and three of the balls are black. Stephen takes at random one ball from each bag.

Calculate the probability that at least one ball is black.

Answer _____ [3]

Examiner Only	
Marks	Remark
Total Question 14	

15



Use the graph of $y = \cos x$ to solve the equation $\cos x = -0.85$

Answer $x =$ _____ [2]

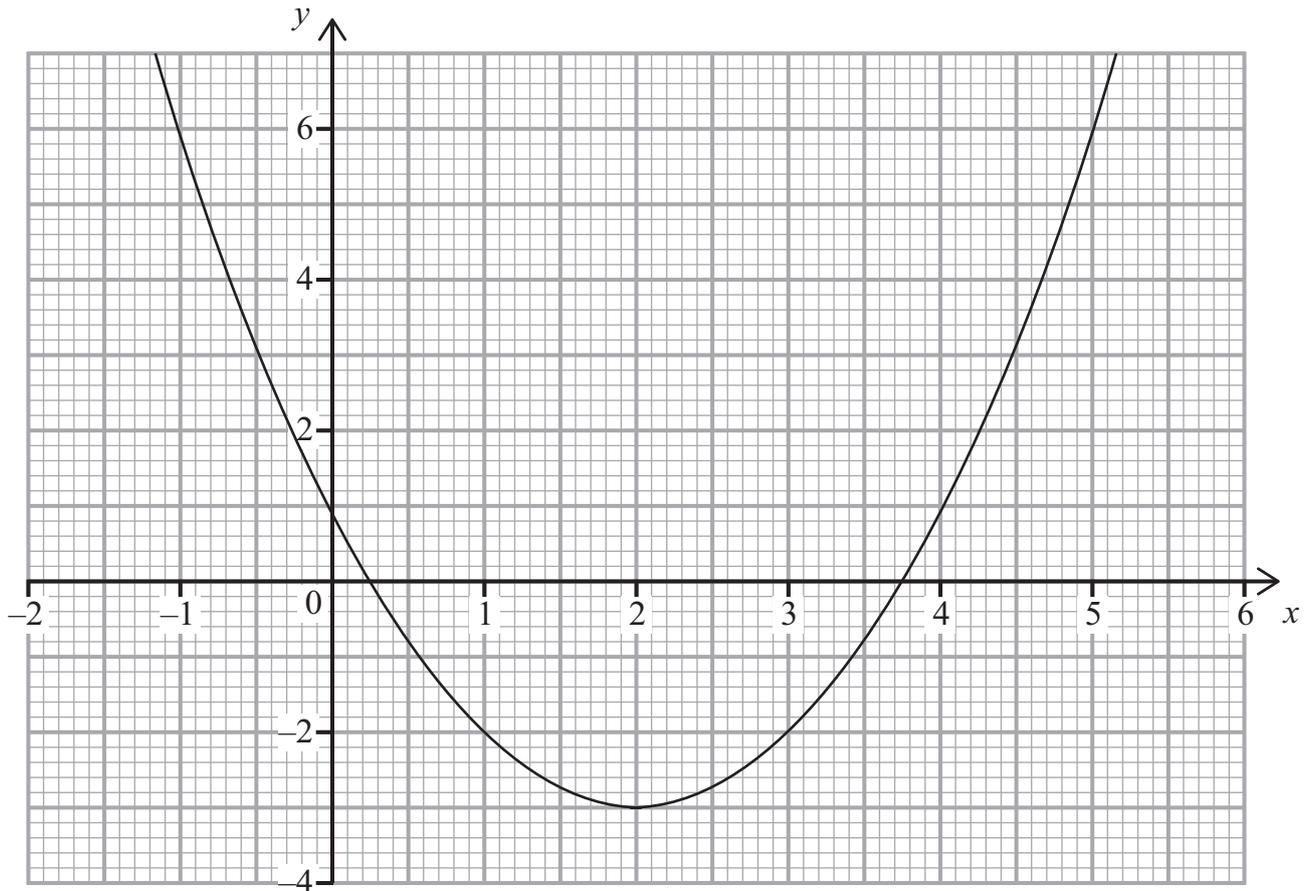
Examiner Only

Marks	Remark

Total Question 15

[Turn over

16 The graph of $y = x^2 - 4x + 1$ is drawn.



By drawing an appropriate straight line on the grid, solve the equation $x^2 - 3x - 2 = 0$

Answer $x =$ _____ [3]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark
Total Question 16	

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Question Number	Marks
1	
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16	

Total Marks	
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Examiner Number

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