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Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2016

Mathematics

Unit T6 Paper 1
(Non-calculator)
Higher Tier

GMT61

[GMT61]

THURSDAY 2 JUNE, 9.15am–10.30am

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.
All 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.

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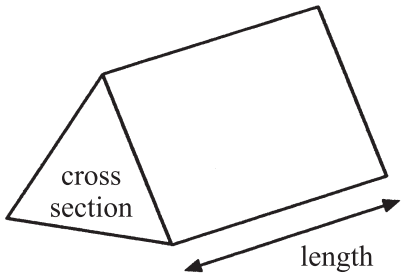
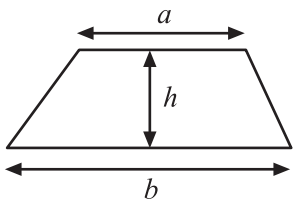
Formula Sheet

Volume of prism = area of cross section × length

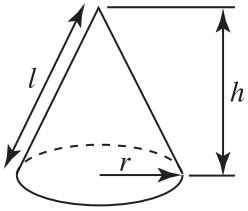


Area of trapezium $= \frac{1}{2}(a+b)h$



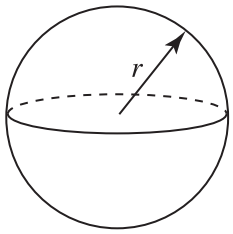
Volume of cone $= \frac{1}{3}\pi r^2 h$

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

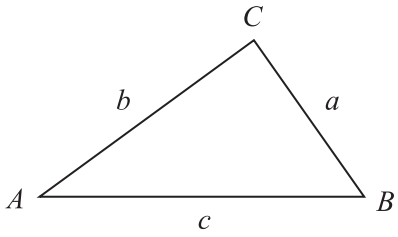


Volume of sphere $= \frac{4}{3}\pi r^3$

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



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: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

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

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1 Use the information $639 \times 8.5 = 5431.5$ to find the value of

(a) 6.39×85

Answer _____ [1]

(b) $543.15 \div 850$

Answer _____ [1]

2 Work out the value of $\dfrac{a(3b + 1)}{5}$

when $a = -2$ and $b = 3$

Answer _____ [2]

[Turn over

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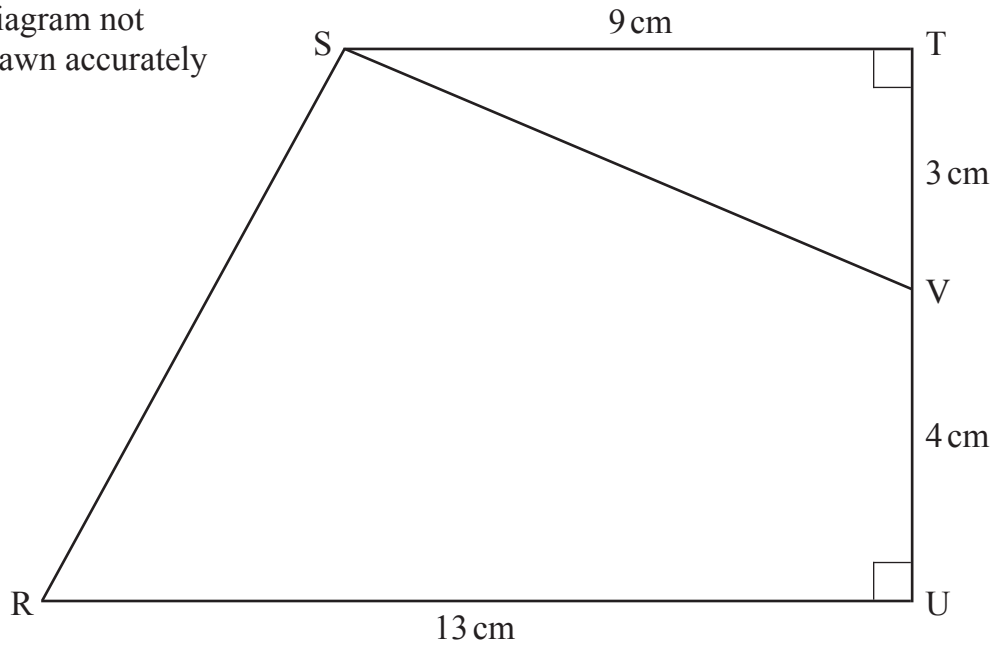
3 STUR is a trapezium. ST and RU are perpendicular to the line TU.

TV = 3 cm, VU = 4 cm, ST = 9 cm and RU = 13 cm.

Diagram not drawn accurately



Find the area of the

(a) trapezium STUR,

Answer _____ cm^2 [2]

(b) quadrilateral SVUR.

Answer _____ cm^2 [2]

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4 The table shows information about the amounts of money pupils spent in the school canteen one Friday. The probabilities for some of the amounts are given in the table.

Amount £m	$0 < m \leqslant 1$	$1 < m \leqslant 2$	$2 < m \leqslant 3$	$3 < m \leqslant 4$	$4 < m \leqslant 5$	$5 < m \leqslant 6$	$m > 6$
Probability	0	0.15	0.25		0.2	0.05	0

(a) What is the missing probability?

Answer _____ [2]

(b) What is the probability that a pupil spent more than £4?

Answer _____ [2]

(c) What is the probability that a pupil spent more than £5 **or** not more than £2?

Answer _____ [2]

(d) The following Friday, 800 pupils spent money in the canteen. How many would you expect to have spent more than £5?

Answer _____ [2]

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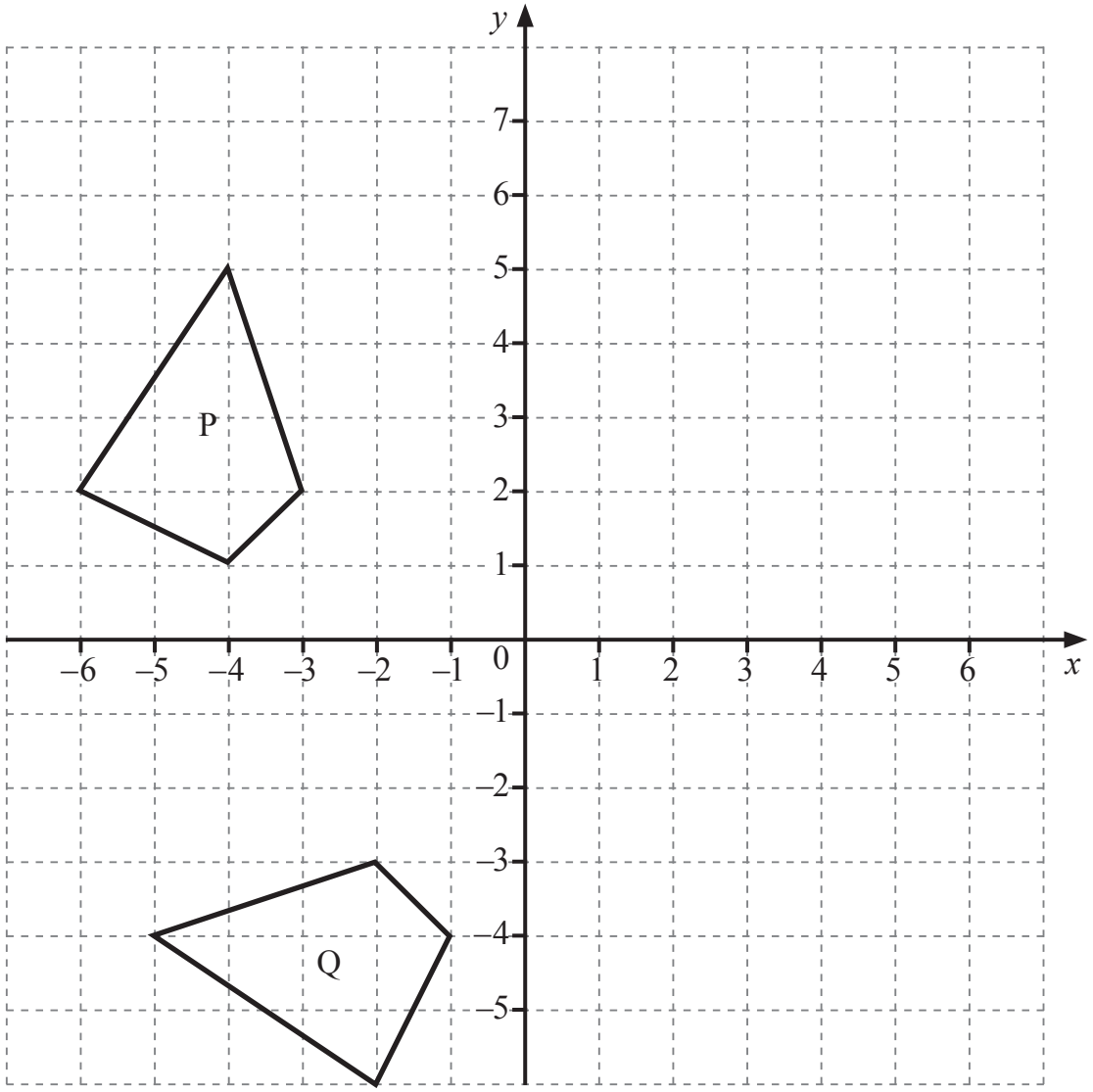
5



(a) Describe fully a single transformation which maps P onto Q.

Answer _____ [3]

(b) Draw the locus of all points which are the same distance from (1, 1) as they are from (1, 5). [2]

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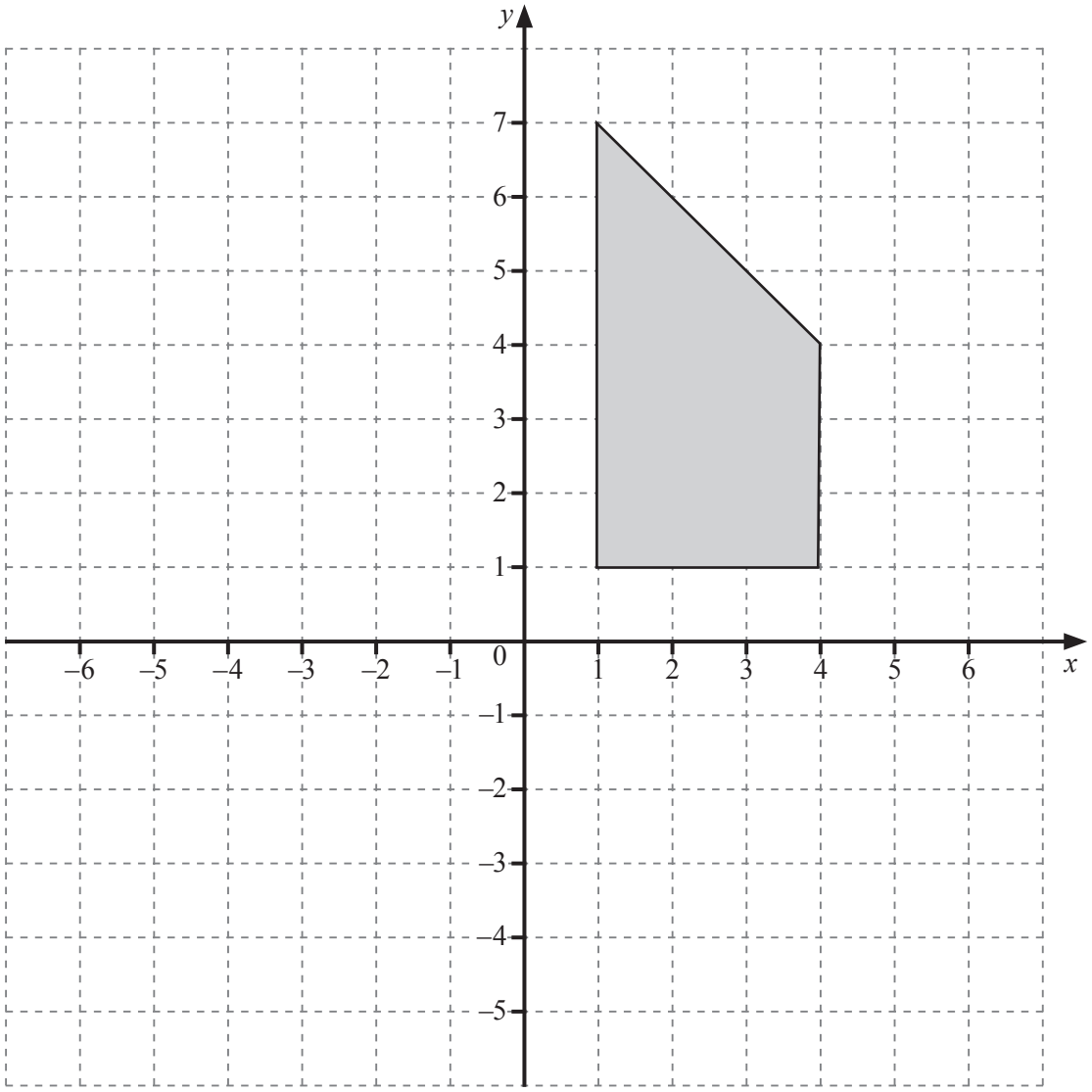
6 Enlarge the shape by scale factor $\frac{1}{3}$ using the centre C(–2, 1). Shade your answer.



[2]

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7 **Estimate** the value of

$$\frac{298.7 \times 4.13}{0.526}$$

You must show all your working.

Answer _____ [3]

8 90 pupils audition for a part in the school play. 60 are girls.

The probability that a girl gets a part is 0.35 and the probability that a boy gets a part is 0.6

How many pupils are in the school play?

Answer _____ [4]

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9 *a, b, c, d, e, f, g* and *h* all represent lengths.

By considering dimensions find out which two of the following expressions could represent volume.

P $3\sqrt{abc}$

Q $4(6d + 0.3e)^3$

R $(2fg + 0.5fgh)^3$

S $\dfrac{d^3 + e^3 + f^3}{3\pi}$

Answer _____ and _____ [2]

[Turn over

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10 **(a)** Work out $(7.2 \times 10^{-8}) \div (9 \times 10^{-3})$.

Give your answer in standard form.

Answer _____ [2]

(b) Express $\frac{5}{11}$ as a recurring decimal.

Answer _____ [1]

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11 Rory and Tiger play two rounds of golf.

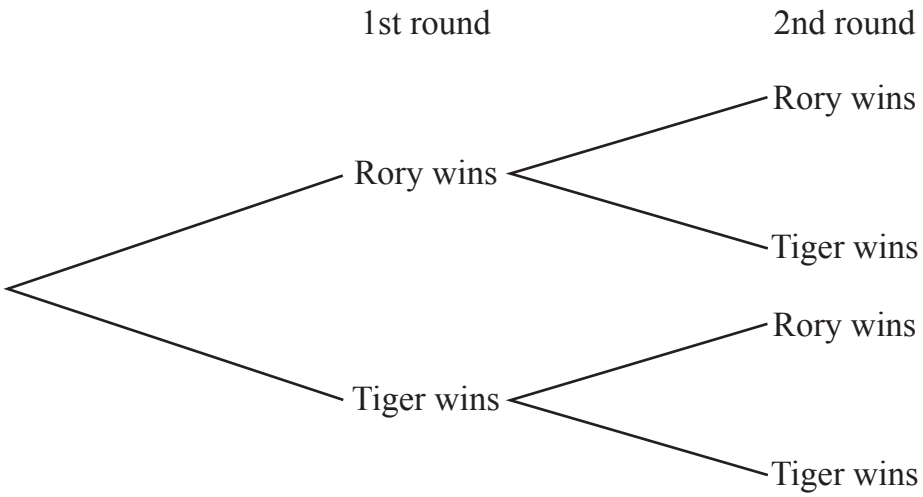
The probability that Rory wins the first round is $\frac{7}{10}$

If Rory wins the first round, the probability of him winning the second round is $\frac{4}{5}$

If he loses the first round, the probability of him winning the second round is $\frac{2}{5}$

A draw is not possible.

(a) Complete the probability tree diagram. [3]



(b) Calculate the probability that Rory wins at least one round.

Answer _____ [3]

[Turn over

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12 Write $\dfrac{\sqrt{125}-\sqrt{45}}{\sqrt{125}+\sqrt{45}}$ in its simplest form.

Answer _____ [3]

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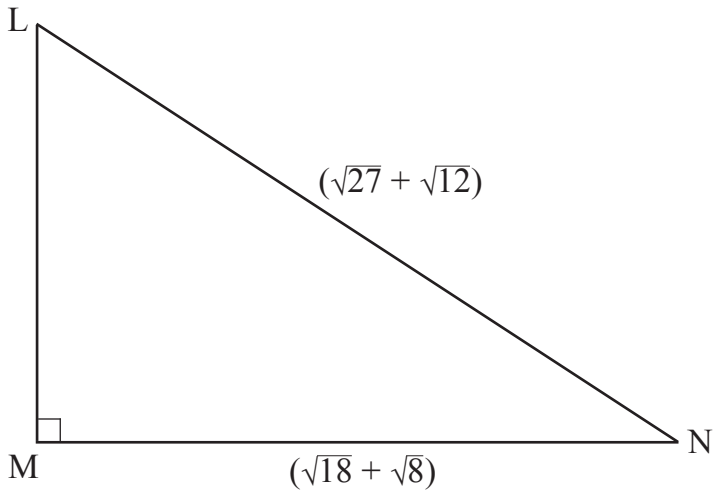
Quality of written communication will be assessed in this question.

13



LMN is a right-angled triangle with angle M = 90°

LN = $(\sqrt{27} + \sqrt{12})$ cm

MN = $(\sqrt{18} + \sqrt{8})$ cm

Show that LM = 5 cm.

[4]

[Turn over

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14 Tim has drawn the graph of $y = 2x^2 - x - 23$

What line should be drawn on the graph to solve the equation $x^2 - x - 12 = 0$?

Answer _____ [2]

THIS IS THE END OF THE QUESTION PAPER

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Question Number	**Marks**
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14	
Total Marks	

Examiner Number

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