



General Certificate of Secondary Education  
2024

Centre Number

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Candidate Number

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# Mathematics

Unit M7 Paper 2  
(With calculator)  
Higher Tier



[GMC72]

\*GMC72\*

**MONDAY 3 JUNE, 10.45 am–12 NOON**

## 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 black ink only. **Do not write with a gel pen.**

Answer **all sixteen** questions.

All working should be clearly shown in the spaces provided. 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.

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

The Formula Sheet is on page 2.

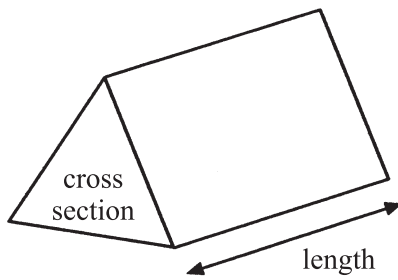
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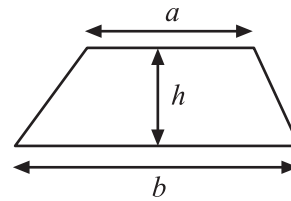
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# Formula Sheet

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

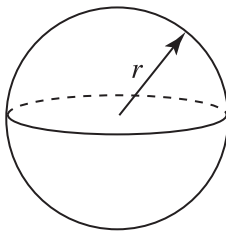


**Area of trapezium** =  $\frac{1}{2}(a + b)h$



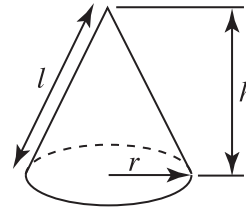
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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

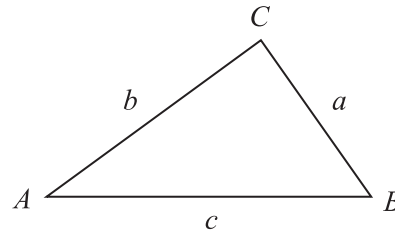


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**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

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

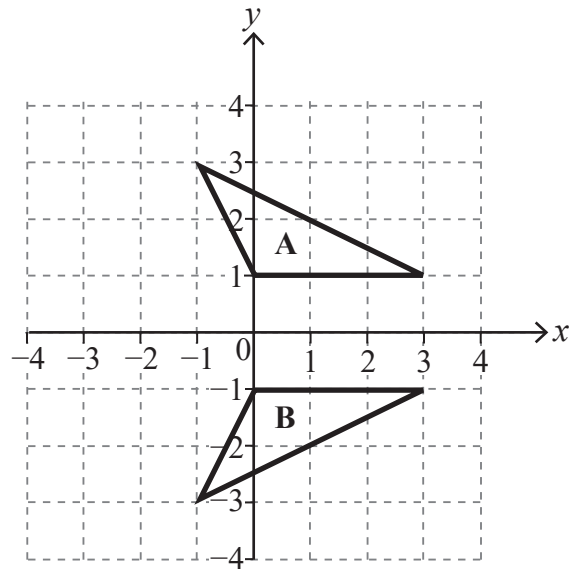
**Sine Rule:**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

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



1 Describe fully the **single** transformation that takes triangle A to triangle B.



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

2 Each new number in a sequence is found using the rule

**divide by 3 and then subtract 5**

Find the next number in this sequence.

24, 3, \_\_\_\_\_

[1]

[Turn over



3



Source: © Getty Images

Pete is filling 5-litre petrol cans from a large tank of petrol.

The tank contains 16 gallons.

Pete knows that 1 gallon = 4.5 litres.

How many 5-litre cans does he need to empty the tank?

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

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4 Jack ran 4 km each day during the month of June.

He thinks he has run the length of 3 marathons.

A marathon is 26.2 miles long.

Is he right?

Explain your answer.

Answer \_\_\_\_\_ because \_\_\_\_\_

[4]

[Turn over



5 The heights (in cm) of students in a Year 1 class are recorded in the table below.

	$90 \leq h < 95$	$95 \leq h < 100$	$100 \leq h < 110$
Girl	6	5	2
Boy	4	7	6

A student is taken at random from the class.

(a) What is the probability of taking

(i) a girl with height  $100 \leq h < 110$ ,

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

(ii) a boy,

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

(iii) a student with height  $90 \leq h < 95$ ,

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

(iv) a girl with height  $90 \leq h < 100$ ?

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



(b) An event is held for Year 1 students.

600 Year 1 students attend.

Estimate how many of the students have height  $100 \leq h < 110$

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



6 The number of oysters collected by divers for a number of dives is recorded.

Name	Number of dives	Number of oysters collected
Diving Dan	16	84
Scuba Sam	11	33
Clammy Colin	24	102

Which diver is the best at collecting oysters?

Show your working clearly.

Answer \_\_\_\_\_

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





7 Work out the value of  $x$  in the pentagon below.

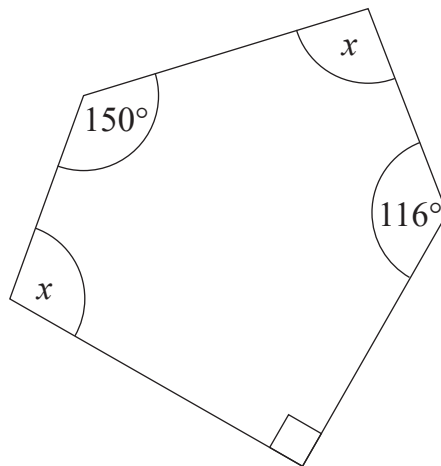


diagram not  
drawn  
accurately

Answer  $x =$  \_\_\_\_\_  $^\circ$  [4]



8 In a local election the following figures were recorded at three polling stations.

Station	Number who voted	Number registered to vote
A	645	1270
B	860	1548
C	1450	3015

Of the total number of those registered to vote, what percentage voted?

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



9 Tammy makes cordial using fruit juice and sparkling water in the ratio 1:3

Tammy has 800 ml of fruit juice and 2100 ml of sparkling water.

What is the greatest amount of cordial she can make?

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



10 Sarah rolls a fair dice and tosses a fair coin.

What is the probability that she gets a number less than 5 and a Head?

Show your working out.

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

11  $x^a \times x^4 = x^{12}$

Find the value of  $a$ .

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





13 There are 200 students in Year 8 and 160 students in Year 9

There are 120 girls in Year 8 and 100 girls in Year 9

The probability that a girl plays a musical instrument is 0.3

The probability that a boy plays a musical instrument is 0.25

A student is taken at random from the students who play a musical instrument.

What is the probability that it is a boy?

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



14  $A$  varies directly as the square of  $x$ .

When  $x = 5$ ,  $A = 20$

Calculate the value of  $x$  when  $A = 45$

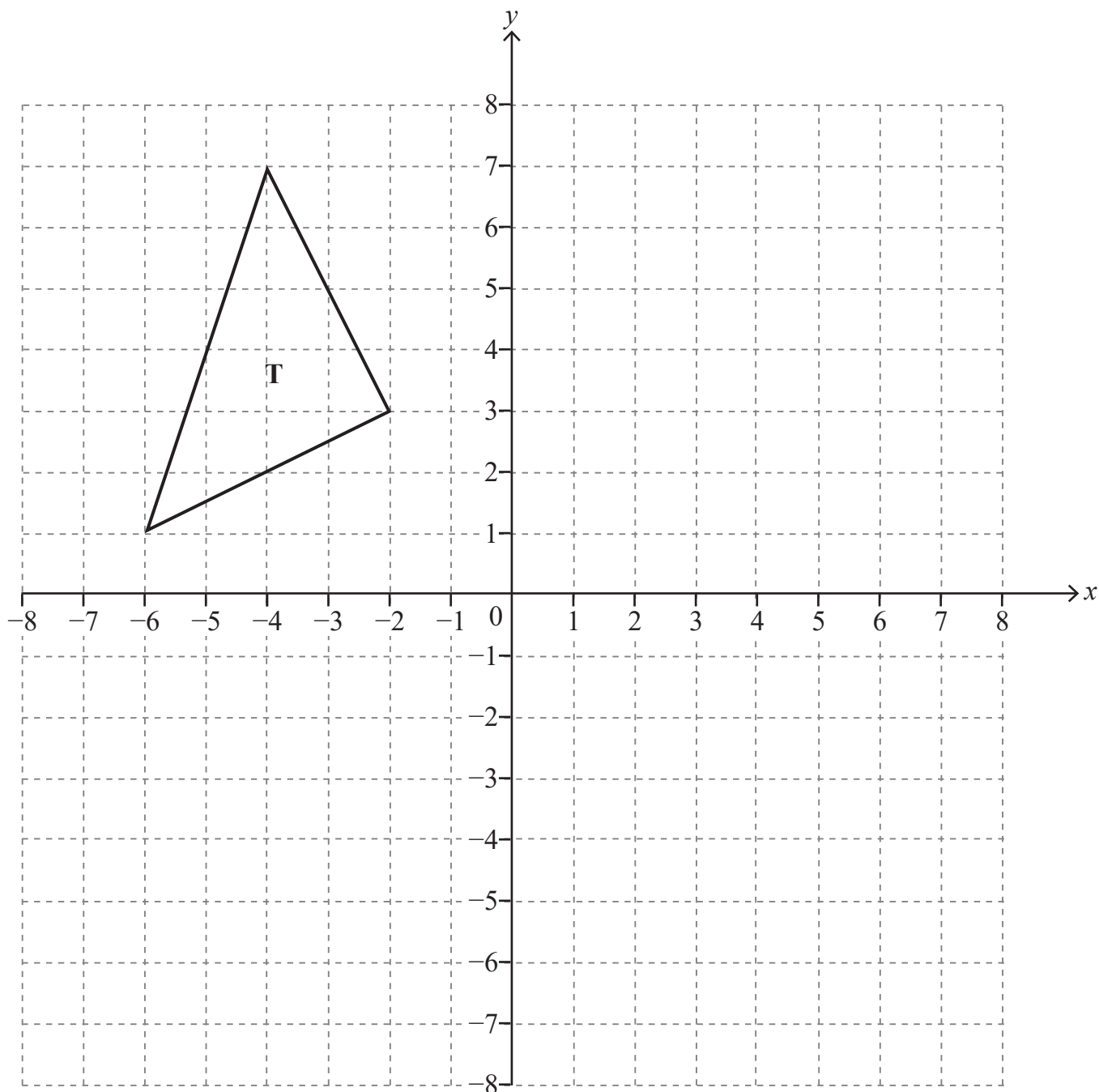
Answer  $x =$  \_\_\_\_\_ [4]

[Turn over



- 15 Triangle T is reflected in the line  $y = x$  and then enlarged by a scale factor of  $\frac{1}{2}$  using the centre of enlargement  $(7, 2)$ .

Draw the final image and label it F.



[4]





16 The table shows the probability of getting each number on a biased dice.

Number on dice	1	2	3	4	5	6
Probability	0.18	0.2	0.3	0.1	0.1	0.12

The dice is rolled twice and the numbers are added together.

What is the probability of getting a total of 5?

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

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

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Question Number	Marks
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<b>Total Marks</b>	
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Examiner Number

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