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**CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/02**

Paper 2 Non-calculator (Extended)

**For examination from 2025**

SPECIMEN PAPER

**1 hour 30 minutes**

You must answer on the question paper.

You will need: Geometrical instruments

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly. You will be given marks for correct methods even if your answer is incorrect.

## INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

## List of formulas

Area,  $A$ , of triangle, base  $b$ , height  $h$ .  $A = \frac{1}{2}bh$

Area,  $A$ , of circle of radius  $r$ .  $A = \pi r^2$

Circumference,  $C$ , of circle of radius  $r$ .  $C = 2\pi r$

Curved surface area,  $A$ , of cylinder of radius  $r$ , height  $h$ .  $A = 2\pi rh$

Curved surface area,  $A$ , of cone of radius  $r$ , sloping edge  $l$ .  $A = \pi rl$

Surface area,  $A$ , of sphere of radius  $r$ .  $A = 4\pi r^2$

Volume,  $V$ , of prism, cross-sectional area  $A$ , length  $l$ .  $V = Al$

Volume,  $V$ , of pyramid, base area  $A$ , height  $h$ .  $V = \frac{1}{3}Ah$

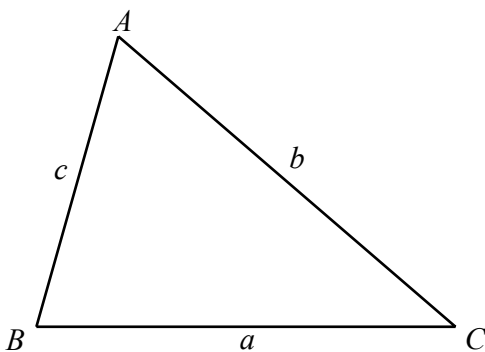
Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .  $V = \pi r^2 h$

Volume,  $V$ , of cone of radius  $r$ , height  $h$ .  $V = \frac{1}{3}\pi r^2 h$

Volume,  $V$ , of sphere of radius  $r$ .  $V = \frac{4}{3}\pi r^3$

For the equation  $ax^2 + bx + c = 0$ , where  $a \neq 0$ ,  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

For the triangle shown,



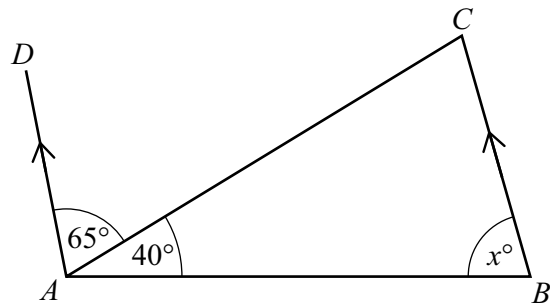
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Calculators must **not** be used in this paper.

1



NOT TO  
SCALE

In the diagram,  $BC$  is parallel to  $AD$ .

Find the value of  $x$ .

$x = \dots\dots\dots$  [2]

2 Work out  $\sqrt{0.0049}$ .

$\dots\dots\dots$  [1]

3 A quadrilateral has

- exactly 2 lines of symmetry
- and
- rotational symmetry of order 2.

Write down the mathematical name of the quadrilateral.

$\dots\dots\dots$  [1]

4 Work out  $\frac{5}{6} - \frac{3}{4}$ .

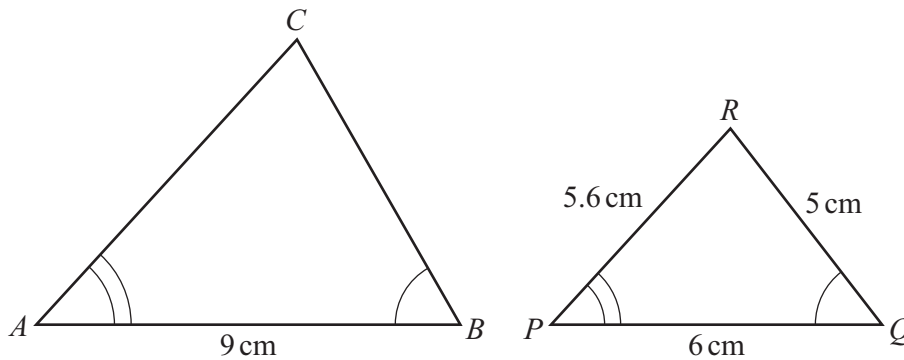
$\dots\dots\dots$  [2]

- 5 Amaya and Dev share some money in the ratio 7:5.  
Amaya receives \$8 more than Dev.

Work out how much Dev receives.

\$ ..... [2]

6



NOT TO  
SCALE

Triangles  $ABC$  and  $PQR$  are similar.

Work out the length of  $AC$ .

$AC = \dots\dots\dots\text{ cm}$  [2]

- 7 In a bookshop, the price of each sports book is \$ $x$  and the price of each recipe book is \$ $y$ .

Jamal buys 5 sports books and 3 recipe books.  
The total Jamal pays is \$59.

Katerina buys 10 sports books and 7 recipe books.  
The total Katerina pays is \$126.

- (a) Use this information to write down two equations in terms of  $x$  and  $y$ .

.....  
.....  
[2]

- (b) Solve your equations to find the value of  $x$  and the value of  $y$ .

$x =$  .....  
 $y =$  .....  
[3]

- (c) Li buys some sports books and recipe books and pays a total of \$37.

Find the number of sports books and the number of recipe books Li buys.

Number of sports books = .....  
Number of recipe books = .....  
[2]

- 8 Rohan rolls a biased die 60 times.  
The table shows the results.

Score	1	2	3	4	5	6
Frequency	11	9	9	11	8	12

(a) Find

(i) the mode of the scores

..... [1]

(ii) the median score

..... [1]

(iii) the range of the scores

..... [1]

(iv) the interquartile range of the scores.

..... [2]

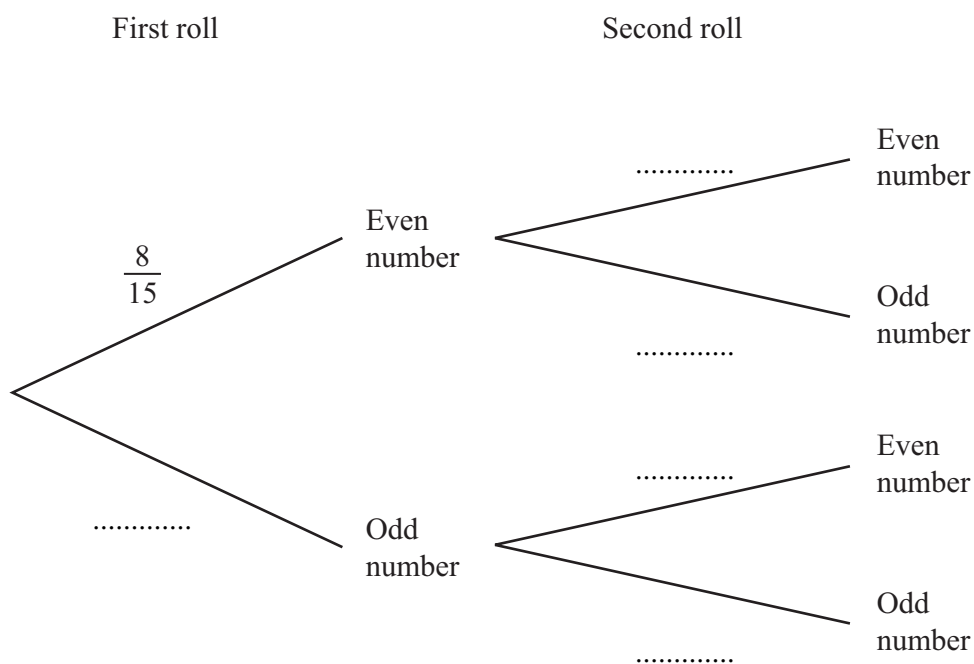
(b) Rohan uses the relative frequencies from the table to estimate the probability of the die showing an even number.

Show that the estimate of this probability is  $\frac{8}{15}$ .

[1]

(c) Rohan rolls the die twice.

(i) Complete the tree diagram to show the estimates of the probabilities of an even number or an odd number on each roll.



[2]

(ii) Work out an estimate of the probability that Rohan rolls one even number and one odd number.

..... [2]

9  $A = \pi r^2 + 2\pi rh$

Rearrange the formula to write  $h$  in terms of  $\pi$ ,  $r$  and  $A$ .

$$h = \dots\dots\dots [2]$$

10  $A$  is the point  $(-1, 2)$  and  $\overrightarrow{AB} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ .

Find the coordinates of the point  $B$ .

$$(\dots\dots\dots, \dots\dots\dots) [2]$$

11 These are the first four terms of a sequence.

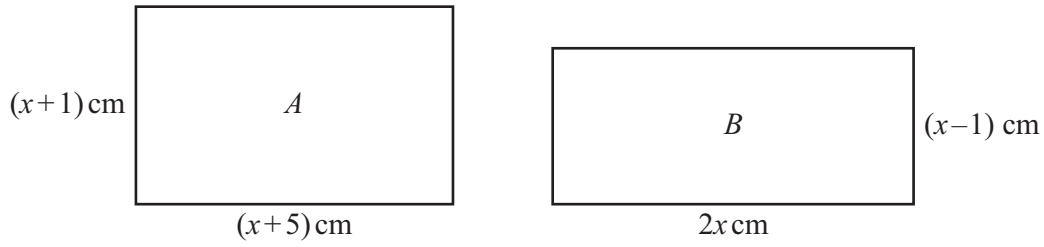
5, 10, 20, 40

Find the  $n$ th term of the sequence.

$$\dots\dots\dots [2]$$



12



The area of rectangle  $B$  is  $4 \text{ cm}^2$  greater than the area of rectangle  $A$ .

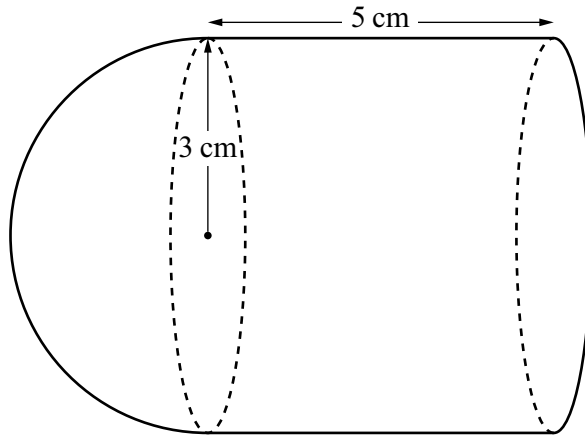
(a) Show that  $x^2 - 8x - 9 = 0$ .

[3]

(b) Find the value of  $x$ .

$x = \dots\dots\dots$  [2]

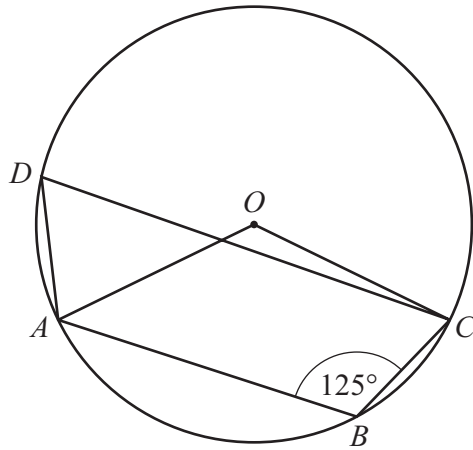
13

NOT TO  
SCALE

A solid is made by joining a hemisphere to a cylinder, as shown in the diagram.  
 The hemisphere has radius 3 cm.  
 The cylinder has radius 3 cm and length 5 cm.  
 The total volume of the solid is  $k\pi \text{ cm}^3$ .

Find the value of  $k$ .

$k = \dots\dots\dots$  [3]



NOT TO SCALE

$A, B, C$  and  $D$  are points on the circumference of the circle, centre  $O$ .

Work out obtuse angle  $AOC$ .

Give a geometric reason for each step of your working.

.....

.....

.....

..... [4]

15  $f(x) = 2x^3 - 1$     $g(x) = 1 - 2x$     $h(x) = 3^{2x}$

(a) Find  $g^{-1}(x)$ .

$$g^{-1}(x) = \dots\dots\dots [2]$$

(b) Solve the equation  $f^{-1}(x) = 4$ .

$$x = \dots\dots\dots [2]$$

(c) Find  $h(2)$ .

$$\dots\dots\dots [1]$$

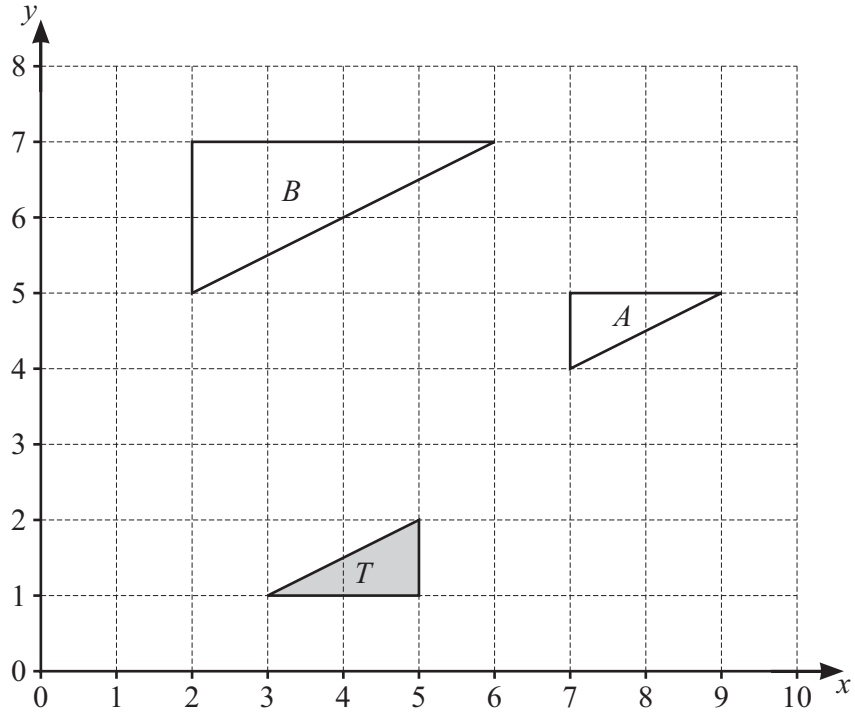
(d) Solve the equation  $h(x) = \frac{1}{9}$ .

$$x = \dots\dots\dots [1]$$

(e) Find  $h^{-1}(x)$ .

$$h^{-1}(x) = \dots\dots\dots [2]$$

16



Describe fully the **single** transformation that maps

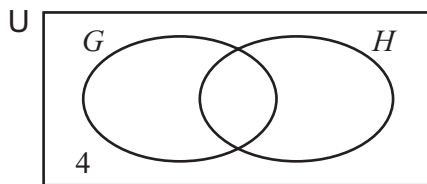
(a) triangle *T* onto triangle *A*

.....  
 ..... [3]

(b) triangle *T* onto triangle *B*.

.....  
 ..... [3]

17 In this question you may use the Venn diagram to help you.



$n(U) = 20 \quad n(G \cup H)' = 4 \quad n(G) = 12 \quad n(H) = 11$

(a) Find  $n(G \cap H)$ .

..... [2]

(b) Find  $n(G' \cap H)$ .

..... [1]

18 Work out  $(3 \times 10^{-11}) \times (4 \times 10^{-8})$ .  
Give your answer in standard form.

..... [2]

19 (a) Simplify  $(32q^{15})^{\frac{2}{5}}$ .

..... [2]

(b) Find the value of  $n$  when  $9^n = 27$ .

$n =$  ..... [2]

20 Simplify.

$$\sqrt{125} - \sqrt{45}$$

..... [2]

21  $y \propto \frac{1}{x^3}$

When  $x = 2$ ,  $y = 4$ .

Find  $y$  in terms of  $x$ .

$y =$  ..... [2]

**Question 22 is printed on the next page.**

22  $x$  is an acute angle and  $\cos x = \frac{\sqrt{3}}{2}$ .

Find the value of

(a)  $\sin x$

..... [2]

(b)  $\cos(180^\circ + x)$ .

..... [1]

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