



# Cambridge IGCSE™

CANDIDATE  
NAME



CENTRE  
NUMBER

--	--	--	--	--

CANDIDATE  
NUMBER

--	--	--	--



## MATHEMATICS

0580/23

Paper 2 (Extended)

October/November 2024

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.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For  $\pi$ , use either your calculator value or 3.142.

### INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has 12 pages.



1

61	62	63	64	65	66	67	68	69
----	----	----	----	----	----	----	----	----

From the list of numbers, write down

(a) a cube number

..... [1]

(b) a prime number.

..... [1]

2 A train journey starts at 23 30 and finishes at 07 15 the next day.

Find the time taken for this journey.

..... h ..... min [1]

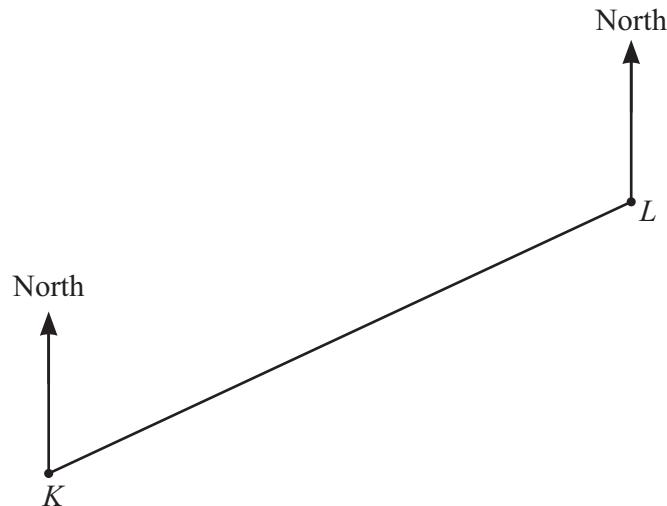
3 Simplify.

$$3p - t - p - 4t$$

..... [2]



- DO NOT WRITE IN THIS MARGIN
- 4 The scale drawing shows the positions of town  $K$  and town  $L$ .  
The scale is 1 cm represents 10 km.



Scale : 1 cm to 10 km

- DO NOT WRITE IN THIS MARGIN
- (a) Find the actual distance between town  $K$  and town  $L$ .

..... km [2]

- (b) Measure the bearing of town  $L$  from town  $K$ .

..... [1]





- 5 Each student in a class of 20 students records the number of coins in their pockets. The table shows the results.

Number of coins	0	1	2	3	4	5	6
Frequency	3	1	7	8	0	0	1

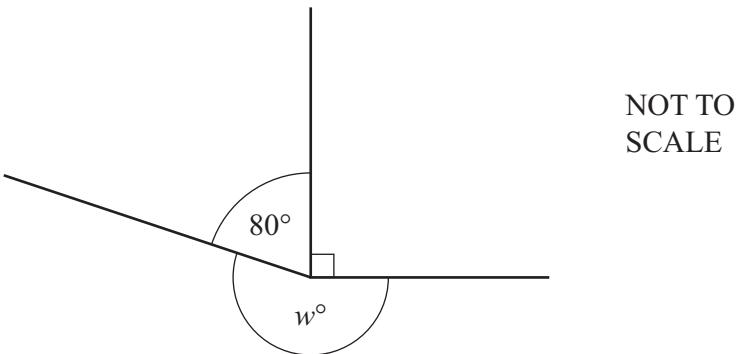
(a) Find the median.

..... [1]

(b) Calculate the mean.

..... [3]

6



The diagram shows three lines meeting at a point.

Find the value of  $w$ .

$w = \dots$  [1]

- 7 Solve the equation.

$$7 - h = 3 - 5h$$

$h = \dots$  [2]





- DO NOT WRITE IN THIS MARGIN
- 8 Sacha buys  $b$  books and  $m$  magazines.  
The cost of each book is \$12 and the cost of each magazine is \$5.

Write an expression, in terms of  $b$  and  $m$ , for the total cost of the books and the magazines.

\$ ..... [2]

- 9 Find the size of an interior angle of a regular 15-sided polygon.

..... [2]

- 10 Without using a calculator, work out  $2\frac{1}{4} - 1\frac{11}{12}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]





**11** Solve the simultaneous equations.

$$\begin{aligned}3p - 2q &= 7 \\ p + 2q &= 1\end{aligned}$$

*p* = .....

*q* = ..... [2]

**12**  $V = \sqrt[3]{\frac{x}{y}}$

Rearrange the formula to write *x* in terms of *V* and *y*.

*x* = ..... [2]

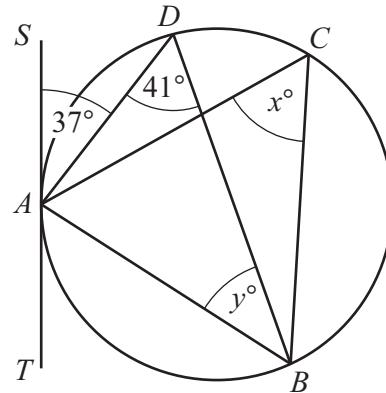
**13** Find the *n*th term of each sequence.

(a) 21, 13, 5, -3, -11, ...

..... [2]

(b) 2.5, 5, 10, 20, 40, ...

..... [2]

**14 (a)**

 NOT TO  
SCALE

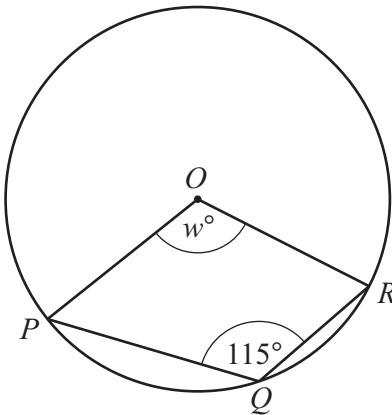
*A, B, C and D lie on the circle.*  
*TAS is a tangent to the circle at A.*

- (i) Find the value of  $x$ .

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

- (ii) Find the value of  $y$ .

$$y = \dots \quad [1]$$

**(b)**

 NOT TO  
SCALE

*P, Q and R lie on the circle, centre O.*

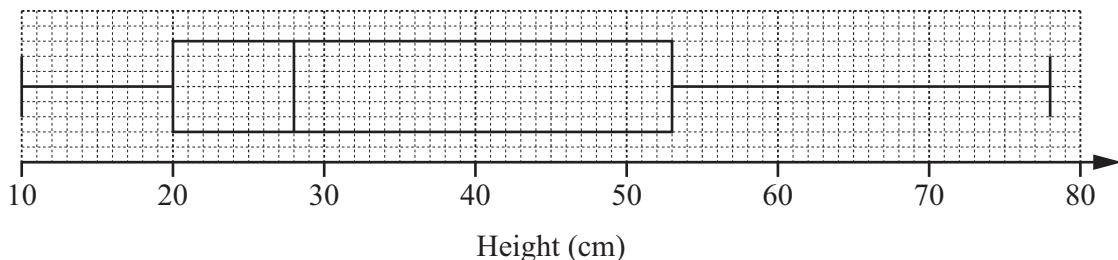
Find the value of  $w$ .

$$w = \dots \quad [2]$$





15



The box-and-whisker diagram shows information about the heights of some plants.

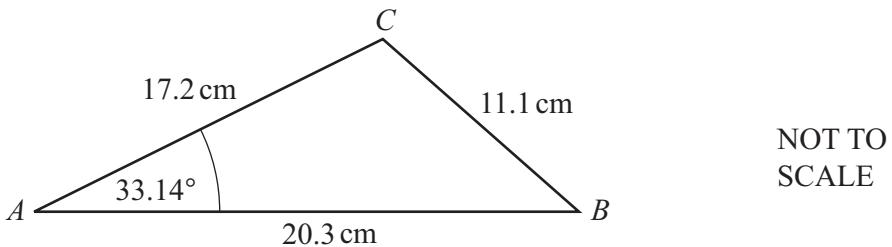
- (a) Find the median height.

..... cm [1]

- (b) Find the interquartile range of the heights.

..... cm [1]

16



Calculate the shortest distance from C to AB.

..... cm [3]

17 Simplify.

(a)  $18x^{18} \div 3x^3$

..... [2]

(b)  $(125y^{75})^{\frac{2}{3}}$

..... [2]



- DO NOT WRITE IN THIS MARGIN
- 18 Two mathematically similar solids have volumes  $81 \text{ cm}^3$  and  $24 \text{ cm}^3$ .  
The height of the smaller solid is 4.8 cm.

Calculate the height of the larger solid.

..... cm [3]

- 19  $y$  is inversely proportional to  $\sqrt{x+2}$ .  
When  $x = 2$ ,  $y = 3$ .

Find  $y$  in terms of  $x$ .

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

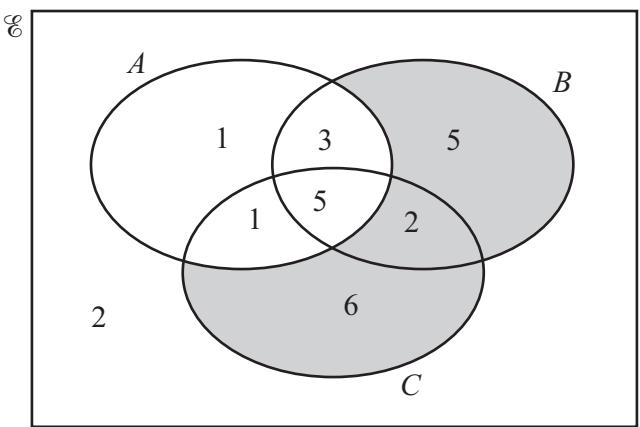
- 20 Solve the equation  $\tan x + 2 = 0$  for  $0^\circ \leq x \leq 360^\circ$ .

$x =$  ..... or  $x =$  ..... [3]





21



The Venn diagram shows the number of elements in each region.

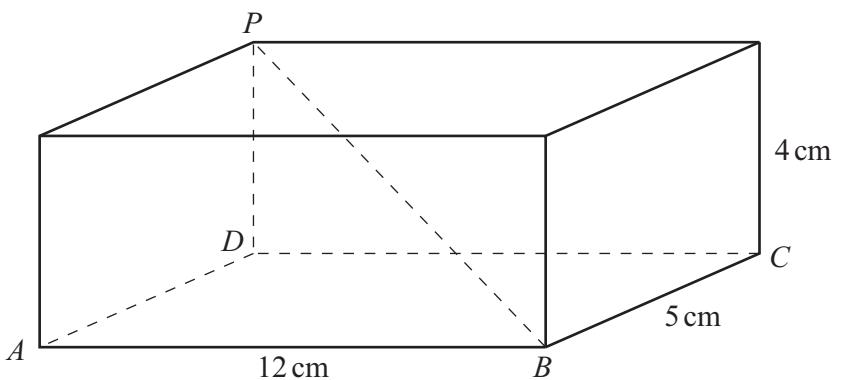
- (a) Use set notation to describe the shaded region.

..... [1]

- (b) Find  $n(A \cap B \cap C)$ .

..... [1]

22



The diagram shows a cuboid with a diagonal  $PB$ .

Calculate the angle between the diagonal  $PB$  and the base  $ABCD$ .

..... [4]



- DO NOT WRITE IN THIS MARGIN
- 23 Write  $x^2 + 8x - 7$  in the form  $(x+a)^2 + b$ .

..... [2]

- 24 A rectangle has an area of  $150 \text{ m}^2$ , correct to the nearest square metre.  
The length of the rectangle is  $22 \text{ m}$ , correct to the nearest metre.

Calculate the upper bound of the width of the rectangle.

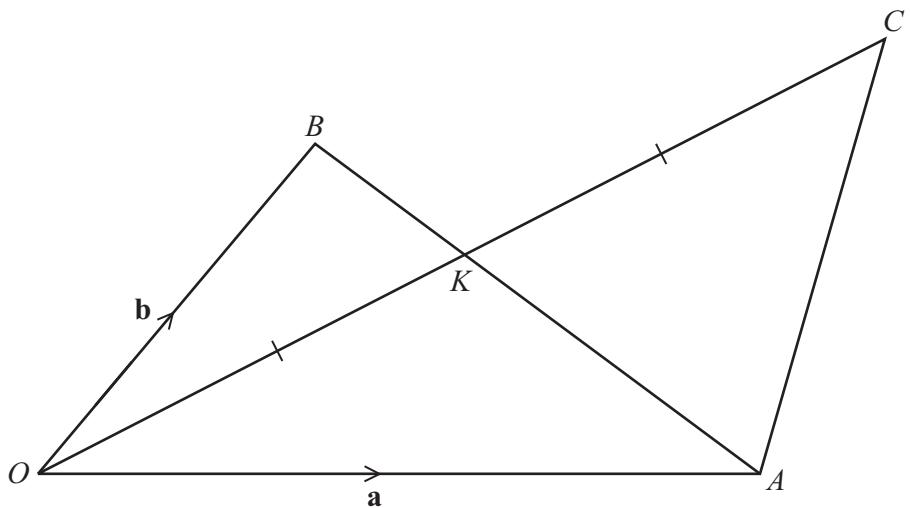
..... m [3]

- 25 Simplify.

$$\frac{3x - 2 - 3xy + 2y}{1 - y^2}$$

..... [4]



NOT TO  
SCALE

In the diagram,  $\overrightarrow{OA} = \mathbf{a}$  and  $\overrightarrow{OB} = \mathbf{b}$ .

$AK : KB = 2 : 1$ .

$OK = KC$ .

Find  $\overrightarrow{AC}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

Give your answer in its simplest form.

$$\overrightarrow{AC} = \dots \quad [4]$$

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cambridgeinternational.org](http://www.cambridgeinternational.org) after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

