Cambridge Assessment International Education

# Cambridge IGCSE™

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CANDIDATE NAME | | | | | | | | | |
| CENTRE NUMBER | | | | | | CANDIDATE NUMBER | | | | |

*5671027834*

**CAMBRIDGE INTERNATIONAL MATHEMATICS** **0607/33**

Paper 3 (Core) **October/November 2023**

**1 hour 45 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 graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- 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 your calculator value.

**INFORMATION**

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.


© UCLES 2023

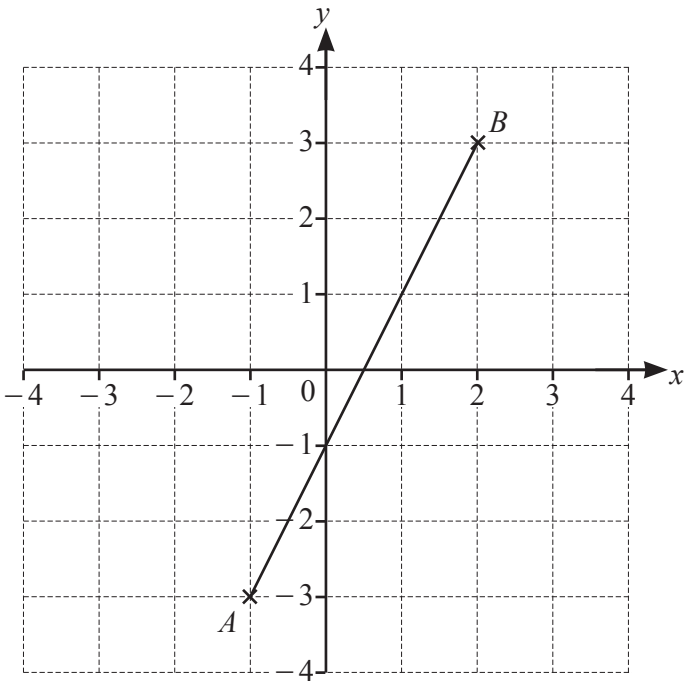
## Formula List

| | |
|---|---|
| Area, $A$, of triangle, base $b$, height $h$. | $A = \frac{1}{2}bh$ |
| Area, $A$, of circle, radius $r$. | $A = \pi r^2$ |
| Circumference, $C$, of circle, 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 $l$. | $A = \pi rl$ |
| Curved 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 $r$. | $V = \frac{4}{3}\pi r^3$ |

© UCLES 2023

Answer **all** the questions.

**1** The line $AB$ is drawn on a 1 cm square grid.




**(a)** Write down the coordinates of point $A$ and point $B$.

$A = ($ ..... , .....$)$

$B = ($ ..... , .....$)$ [2]

**(b)** Write down the coordinates of the mid-point of $AB$.

( ..... , .....) [1]

**(c)** On the grid, plot point $C$ at $(2, -2)$. [1]

**(d)** On the grid, draw a straight line through $C$, parallel to $AB$. [1]

**(e)** On the grid, draw a straight line through $B$, perpendicular to $AB$. [1]

© UCLES 2023

**[Turn over**

**2** **(a)** **(i)** Write 17 852 in words.

.....

..... [1]

**(ii)** Write 17 852 correct to the nearest 100.

..... [1]

**(iii)** Write 17 852 correct to 2 significant figures.

..... [1]

**(b)** **(i)** Write down a multiple of 10.

..... [1]

**(ii)** Write down a factor of 20.

..... [1]

**(iii)** Write down a prime number between 10 and 20.

..... [1]

**(c)** Find the value of

**(i)** $6^2$

..... [1]

**(ii)** $4^5$.

..... [1]

**(d)** **(i)** Find the value of $n$ when $\frac{3}{10} = \frac{n}{30}$.

$n =$ ..... [1]

**(ii)** Write these fractions in order of size, starting with the smallest.

$\frac{2}{5}$ $\frac{1}{3}$ $\frac{11}{30}$ $\frac{3}{10}$

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

*smallest*

© UCLES 2023

**(e)** Work out the following, giving your answers as fractions.

**(i)** $\frac{2}{5} - \frac{1}{3}$

..... [1]

**(ii)** $1\frac{1}{2} \times \frac{11}{30}$

..... [1]

**3** **(a)** Simplify.

$3x + 5y + 7 - 2x + 4y - 9$

..... [3]

**(b)** Factorise completely.

$6x + 15x^2$

..... [2]

**(c)** Solve.

$4(x + 7) = 20$

$x =$ ..... [2]

**(d)** **(i)** Solve the inequality $3x - 2 < 4$.

..... [2]

**(ii)** Write down the largest possible integer value of $x$ for $3x - 2 < 4$.

$x =$ ..... [1]

**4** Inaya surveys the eye colour of everyone in her class.
The table shows her results.

| Eye colour | Blue | Brown | Green | Grey | Other |
|---|---|---|---|---|---|
| Number of students | 5 | 8 | 10 | 7 | 2 |

**(a)** Find how many students are in the survey.

..... [1]

**(b)** What is the most common eye colour?

..... [1]

**(c)** One of the students is chosen at random.

Find the probability that this student has grey eyes.

..... [1]

**(d)** One of the students is chosen at random.

Find the probability that this student has blue eyes or brown eyes.

..... [1]

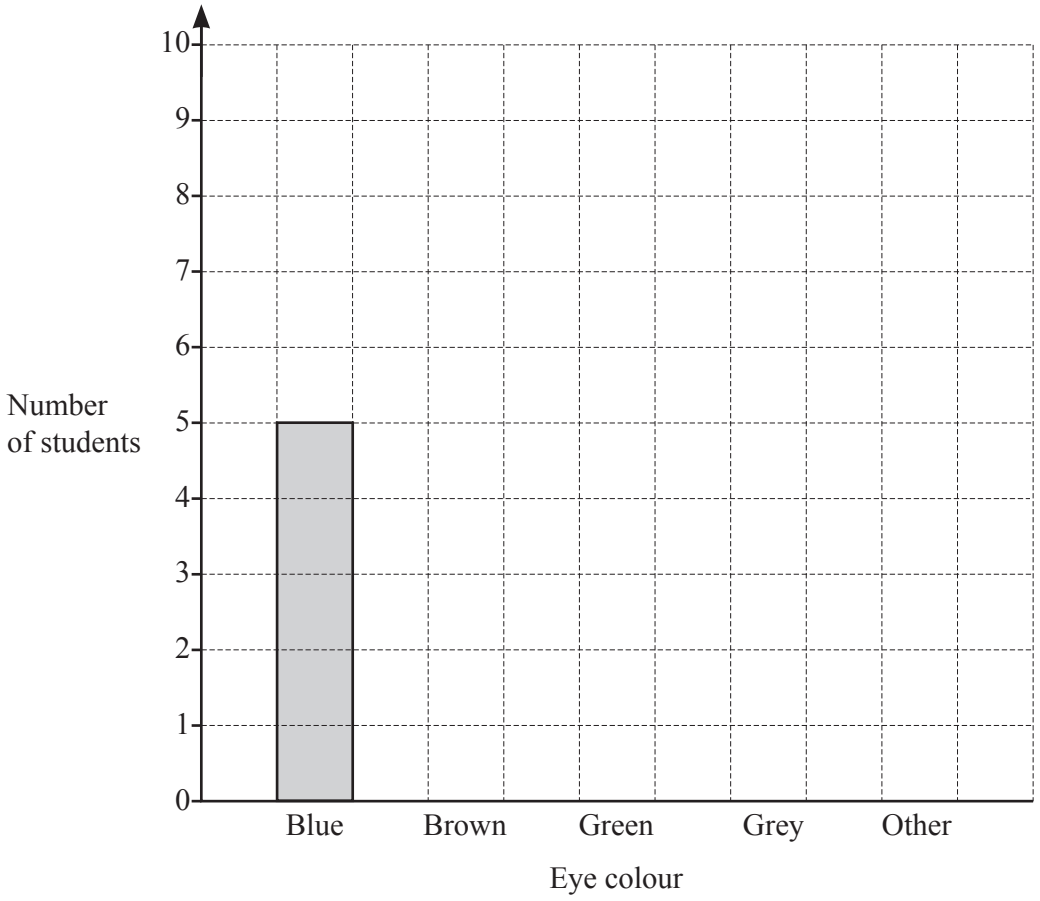
**(e)** There are 256 students in the school.

Work out an estimate of how many of these students have green eyes.

..... [2]

© UCLES 2023

**(f)** Complete the bar chart to show the information in the table.




[2]

**5** This is a sign at a golf club.

| AAA GOLF CLUB |
| --- |
| One round of golf: $24 each player |
| Golf balls: $2.25 each |

**(a)** 4 friends go to the golf club to play one round of golf.
They each buy 3 golf balls.

Work out the total that they pay.

$ ..... [3]

**(b)** Ali and Ben are senior golf players.
The golf club offers each senior player a 12% discount.
Ali pays for them both to play one round of golf.

Work out how much he pays.

$ ..... [3]

**(c)** There are 288 members of AAA Golf Club.
The members are in the ratio

male : female = 5 : 4 .

Work out how many males and how many females are members of AAA Golf Club.

male .....

female ..... [2]

© UCLES 2023

**(d)** These are the scores Lennie has in 10 rounds of golf.

91 76 102 73 82 89 88 71 92 86

**(i)** Find the mean.

..... [1]

**(ii)** Find the median.

..... [1]

**(iii)** Draw a stem-and-leaf diagram for the ten scores.

| | |
|---|---|
| | |
| | |
| | |
| | |

Key : ..... | ..... means ..... [3]

**(iv)** Find the range of the ten scores.

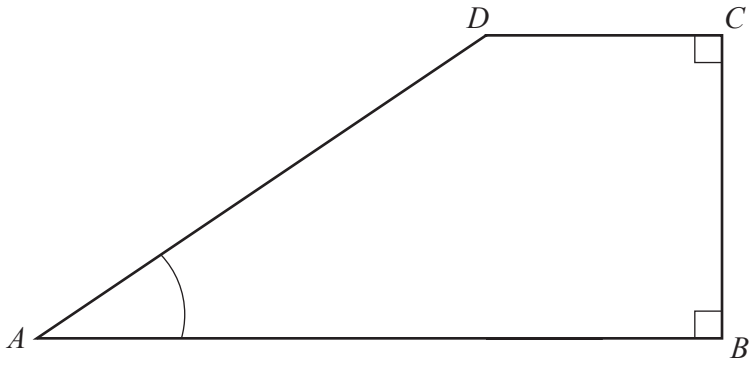
..... [1]

**(v)** Lennie plays one more round of golf.
After this, the range of his scores is 35.

Work out the possible scores for that last round of golf.

..... [2]

**6** **(a)** The diagram shows a quadrilateral $ABCD$.




**(i)** Write down the mathematical name for this quadrilateral.

..... [1]

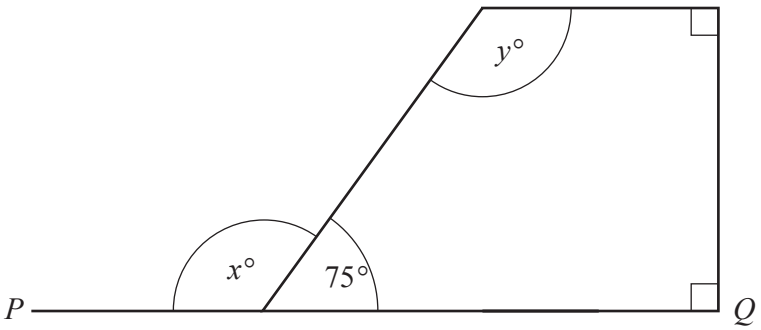
**(ii)** Give a geometric reason for choosing your answer to **part (i)**.

..... [1]

**(iii)** Measure angle $BAD$.

Angle $BAD$ = ..... [1]

**(b)**




NOT TO SCALE

Here is another quadrilateral.
$PQ$ is a straight line.

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

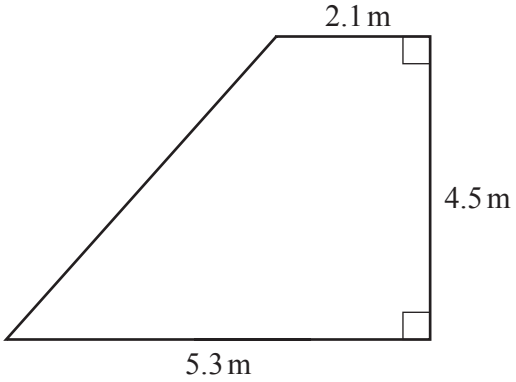
$x$ = ..... [1]

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

$y$ = ..... [1]

© UCLES 2023

**(c)** Here is a different quadrilateral.




NOT TO SCALE

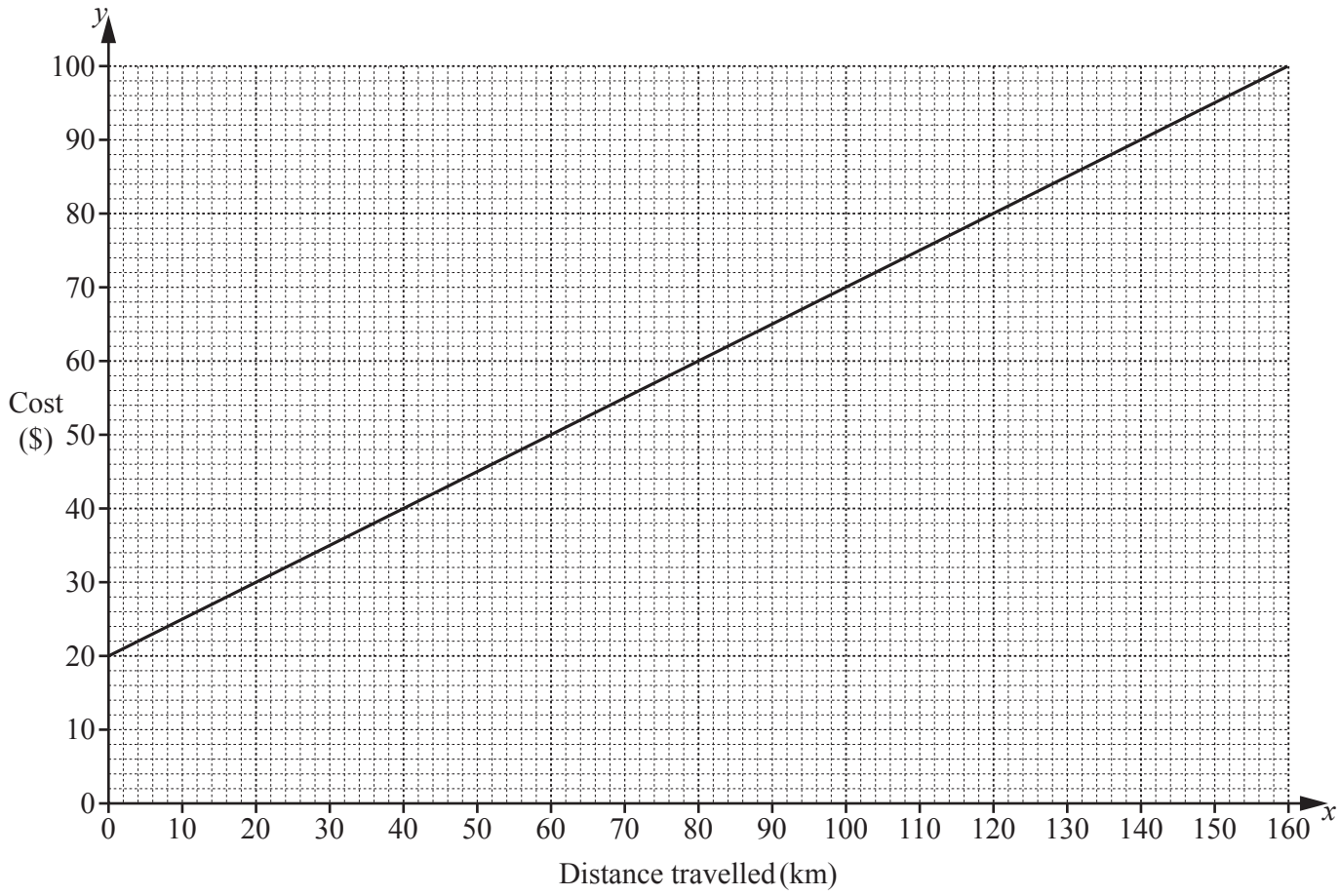
**(i)** Find the area of this quadrilateral.

..... $m^2$ [3]

**(ii)** Find the perimeter of this quadrilateral.

..... m [4]

**7** The graph shows the cost of hiring a car.
The cost, \$$y$, depends on the distance, $x$ km, travelled in the car.




**(a)** Paul hires a car and travels a distance of 120 km.

Find how much this costs him.

\$ ..... [1]

**(b)** Bushra hires a car.
It costs her \$50.

Find the distance she travels.

..... km [1]

**(c)** Find the equation of the line drawn on the grid.
Give your answer in the form $y = mx + c$.

..... [3]

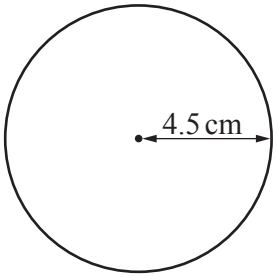
© UCLES 2023

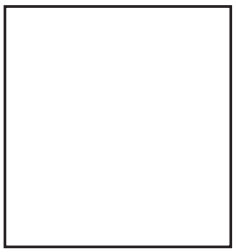
**(d)** Carmen hires a car and travels a distance of 350 km.

Using your answer to **part (c)**, work out how much this costs her.

$ ..... [2]

**8**




NOT TO SCALE

The area of the circle is equal to the area of the square.
The length of one side of the square is $x$ cm.

Find the value of $x$.

$x =$ ..... [4]

**9** **(a)** Simplify.

**(i)** $x^6 \times x^3$

..... [1]

**(ii)** $\dfrac{10x^7}{5x^2}$

..... [2]

**(b)** Expand and simplify.

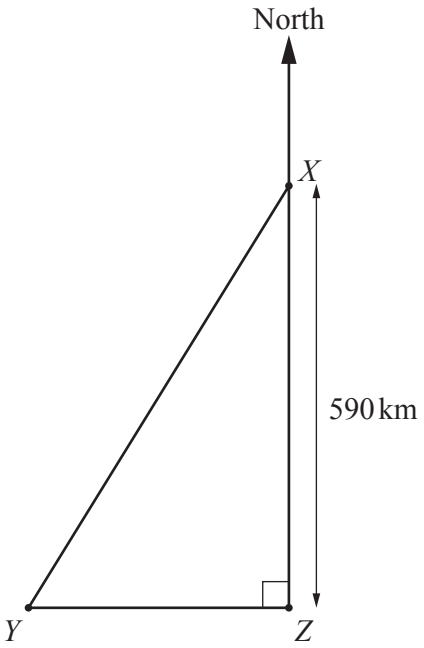
$(x+9)(x-4)$

..... [2]

**(c)** Rearrange $P = \dfrac{K+B}{2}$ to make $K$ the subject.

$K =$ ..... [2]

**10**




NOT TO SCALE

*X*, *Y* and *Z* are three towns.
*Z* is 590 km due South of *X*.
*Y* is due West of *Z*.
The bearing of *Y* from *X* is 220°.

**(a)** Use trigonometry to calculate the distance *XY*.

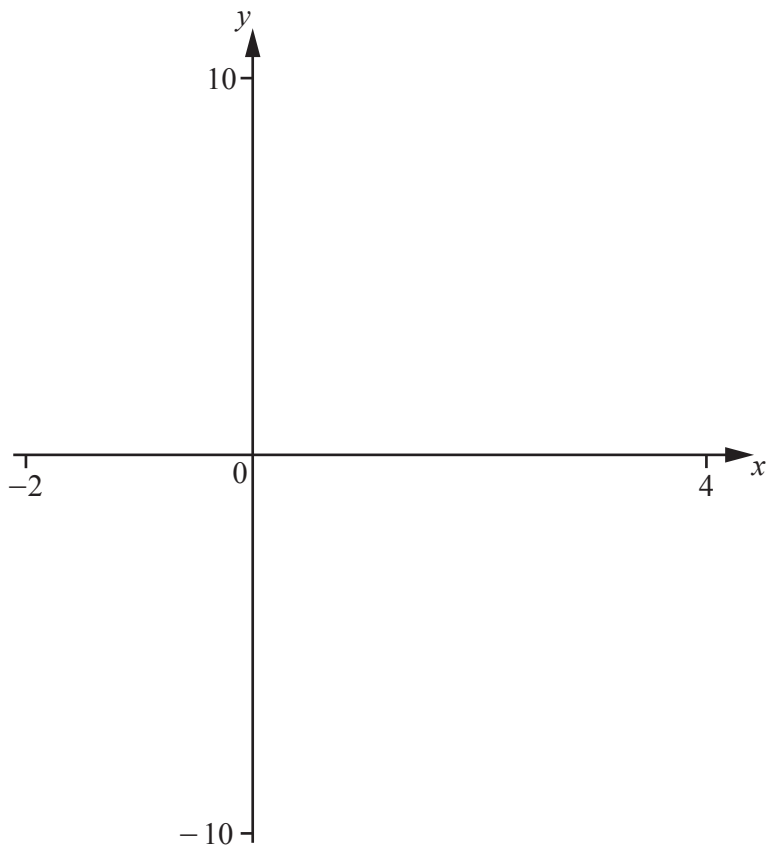
..... km [4]

**(b)** Work out the bearing of *X* from *Y*.

..... [1]

**Question 11 is printed on the next page.**

**11**




**(a)** **(i)** On the diagram, sketch the graph of $y = x^2 - x - 4$ for $-2 \leqslant x \leqslant 4$. [2]

**(ii)** Find the coordinates of the local minimum.

( ..... , .....) [2]

**(b)** On the diagram, sketch the graph of $y = -x^2 + 3x + 2$ for $-2 \leqslant x \leqslant 4$. [2]

**(c)** Find the $x$-coordinate of each point of intersection of $y = x^2 - x - 4$ and $y = -x^2 + 3x + 2$.

$x =$ ..... and $x =$ ..... [2]

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 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.

© UCLES 2023