Cambridge Assessment International Education

Mathematics

Stage 9

Paper 2 **2024**

Cambridge Lower Secondary Progression Test

Name

Class

Date

1 hour

Additional materials: Calculator
Geometrical instruments
Tracing paper (optional)

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

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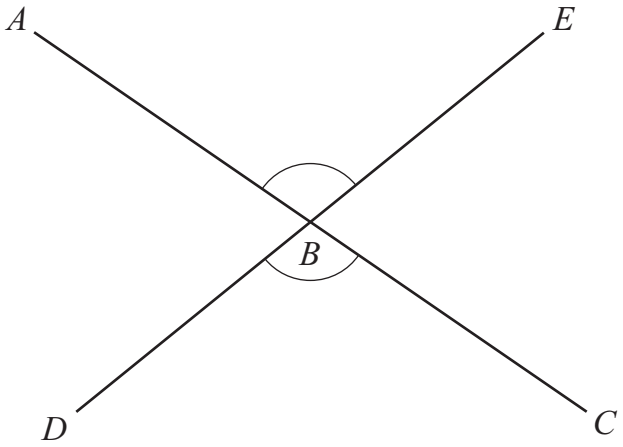
1 Draw a ring around the sum of the interior angles in a hexagon.

180° 360° 720° 1080°

[1]

2 The diagram shows two straight lines, *ABC* and *DBE*.
ABC and *DBE* are **not** perpendicular.



NOT TO SCALE

Tick (✓) to show if each of these statements is true or false.

	True	False
ABE and *DBC* are corresponding angles.	☐	☐
Angle *ABE* = angle *DBC*.	☐	☐
Angle *ABE* + angle *DBC* = 180°.	☐	☐

[1]

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3 The back-to-back stem-and-leaf diagram shows the ages of some of the people in two choirs.

Choir A					Choir B				
				2	3	5			
		5	3	**3**	1	3	4	4	9
7	4	1	0	**4**	2	5	6	7	7
	9	6	2	**5**	3	4	8		
			3	**6**	0	7			
		5	1	**7**					

Key: 2 | **5** | 3 represents a person aged 52 years in Choir A and a person aged 53 years in Choir B

The ages of four people have not been included in the diagram.

Choir A	Choir B
Pierre is 28 years old Mike is 29 years old	Anastasia is 68 years old Samira is 72 years old

Complete the diagram by entering the ages of these four people.

[2]

4 Here are two properties about a number x.

x is greater than 344
x rounds to 340 correct to 2 significant figures.

Write down a possible value of x.

..... [1]

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5 Solve.

$$\frac{18}{y} = 3$$

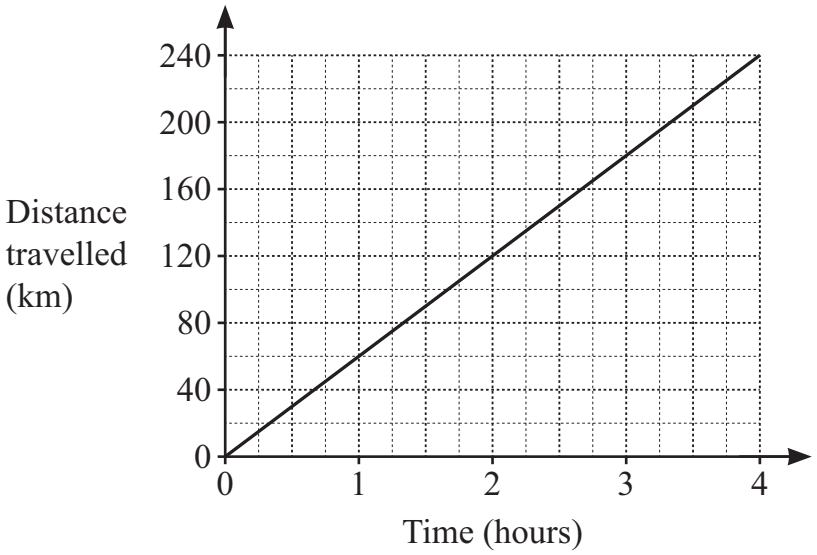
$y =$ ..... [1]

6 A is the point (1, 4) and B is the point (1, 10).

Find the coordinates of the point one third of the way along AB from A.

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

7 Angelique's journey is represented in the distance–time graph.



Calculate Angelique's speed on her journey.

..... km/h [1]

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8 Here are some symbols.

K

$<$ $>$ $=$

Complete each statement by writing one of the symbols.

1 light year ..... 1000 km

1 tonne ..... 1000 kg

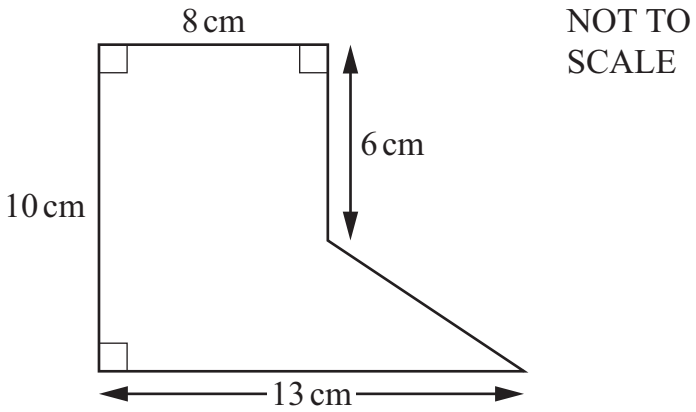
1 microgram ..... 1000 grams

1 terabyte ..... 1000 bytes

[2]

9 The diagram shows the cross-section of a prism.

K



The prism has a length of 7 cm.

Calculate the volume of the prism.

..... cm^3 [2]

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10 An old coin has a value of $5000
The value of the coin increases by 2% every year.

Calculate the value of the coin after 3 years.

$ ..... [2]

11 Write a number in each box to complete each expansion.

$$(x-3)(x+11) = x^2 + \square x - 33$$

$$(x+7)^2 = x^2 + \square x + 49$$

[2]

12 Ahmed wants to find out how much time students in his school spend on their homework.
He decides to choose 12 students from his class as his sample.
Safia says, 'Ahmed could improve his sample by making some changes.'

Tick (✓) each of the changes that should give Ahmed a better sample.

Choose more students.	☐
Choose students from different classes.	☐
Choose students from different schools.	☐

[1]

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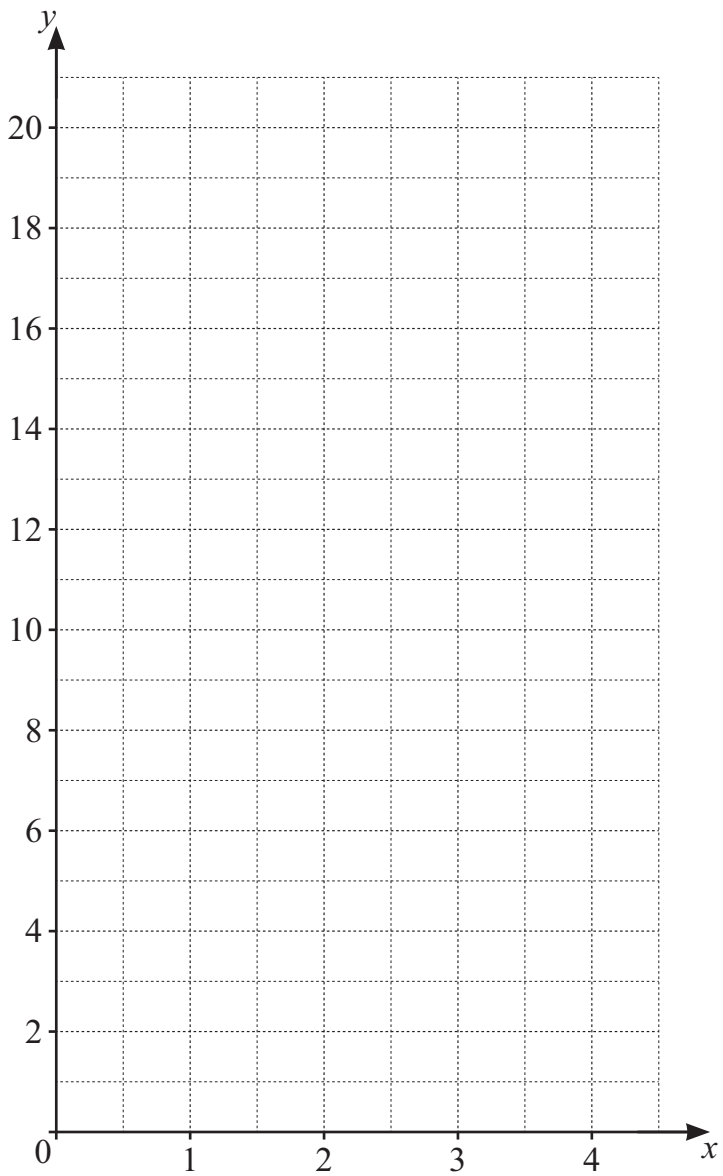
13 Draw the graph of $y = x^2$ between $x = 0$ and $x = 4$

Use the table to help you.

x	0	1	2	3	4
y	0				16



[3]

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14 Sequence A is the linear sequence that begins 3, 6, 9, 12, …

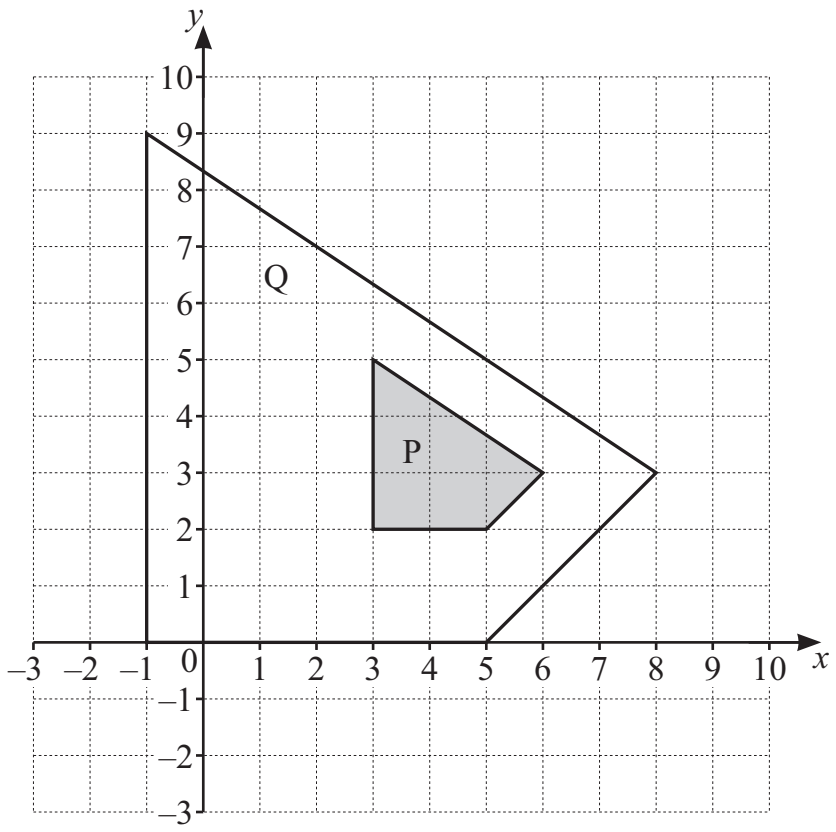
The nth term for sequence B is $4n + 2$

Tick (✓) to show if each statement is true or false.

	True	False
All terms in sequence B are even numbers.	☐	☐
22 is a term in both sequences.	☐	☐
The numbers that are common to **both** sequences are multiples of 6	☐	☐

[1]

15 Two quadrilaterals, P and Q, are shown on the grid.



Describe fully the **single** transformation that maps quadrilateral P to quadrilateral Q.

.....

..... [3]

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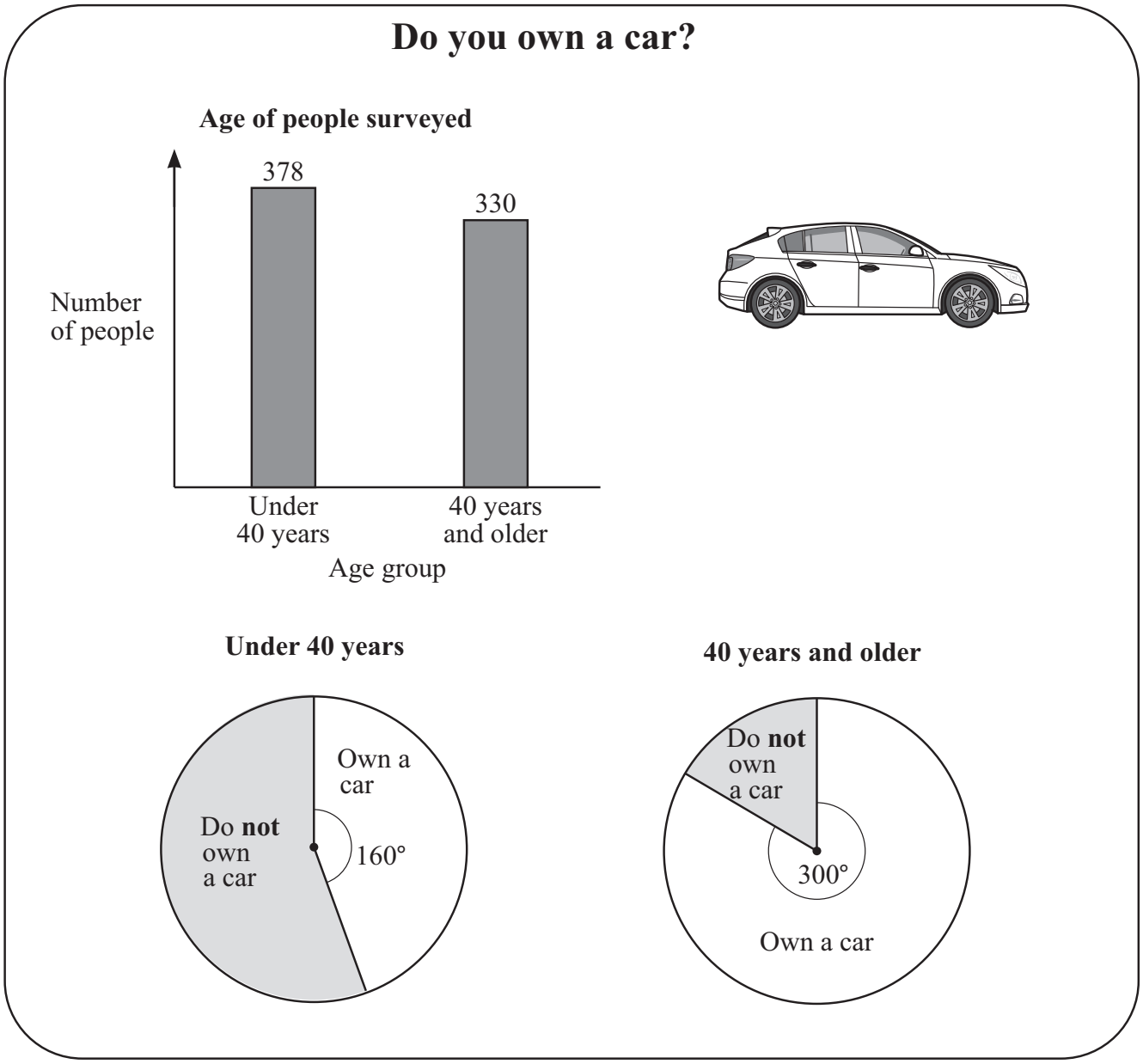
16 Oliver draws this diagram to show some information about people he has surveyed.

The diagram shows
the number of people in each age interval,
the proportion of people in each age interval that own a car.



Calculate the total number of people surveyed who own a car.

..... [2]

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17 Hassan and Lily share some pens in the ratio 1 : 3

Tick (✓) to show if each statement must be true, could be true or must be false.

	Must be true	Could be true	Must be false
Lily gets more pens than Hassan.	☐	☐	☐
Hassan gets $\frac{1}{3}$ of the pens.	☐	☐	☐
The total number of pens is 20	☐	☐	☐

[2]

18 The circumference of a circle is 36.5 cm.

Find the area of the circle.

..... cm^2 [3]

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19 Here is a function.

Input		Output
x	$\longrightarrow$	$y = 2x^3$

Complete the table.

Input, x	Output, y
2.5	
	54

[2]

20 Point P has coordinates $(-4, 3)$.

Point P is translated to the point $(x, 0)$, where $x > 0$

Write down a possible vector for this translation.

$\begin{pmatrix} \ldots\ldots\ldots \\ \ldots\ldots\ldots \end{pmatrix}$

[1]

21 Rearrange the formula $p = \dfrac{3h^2}{5}$ to make h the subject.

$h =$ ..... [2]

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22 A rectangle has a length of $(8x + 10)$ cm and a width of $(3x + 10)$ cm.
The length of the rectangle is twice the width.

By first writing and solving an equation, show that the area of the rectangle is $1250\,\text{cm}^2$.

[3]

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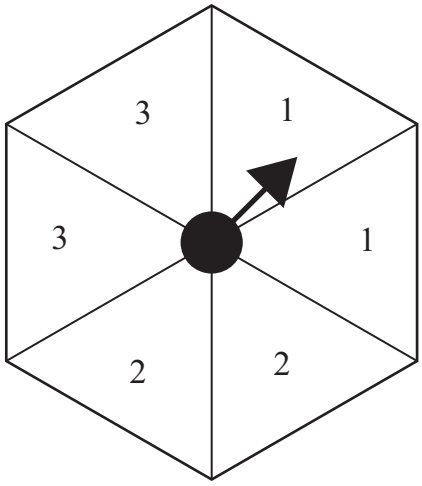
23 Gabriella has two fair spinners.
One spinner is blue and the other is red.
She spins both spinners and adds the two results to give a total score.

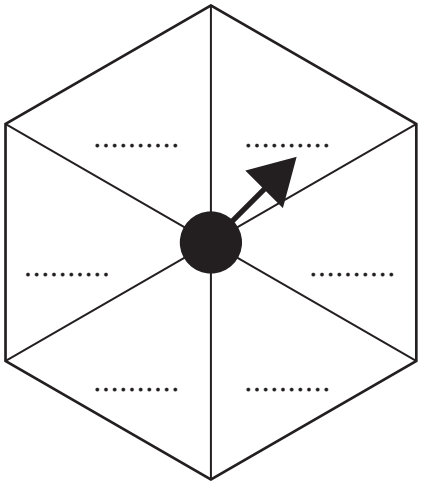
She says,

'Each section of my two spinners is numbered 1 or 2 or 3
The probability that my total score equals 3 is $\frac{1}{9}$'

The diagram shows the numbers on the blue spinner.



Blue spinner



Red spinner

Write six possible numbers on the red spinner to make both of Gabriella's statements true.
You may use the table to help you.

Red spinner

+						
1						
1						
2						
2						
3						
3						

Blue spinner

[2]

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24 Here are two ratios.

$$a : b = 2 : 1 \text{ and } b : c = 4 : 1$$

Draw a ring around the ratio that is equivalent to $a + b : c$.

$12 : 1$ $8 : 1$ $6 : 1$ $3 : 1$

[1]

25 Eva can pick 7200 apples in 6 hours.
Yuri picks the same number of apples in 8 hours as Eva picks in **7.5 hours**.

Calculate how many apples Yuri can pick in 9 hours.

..... [2]

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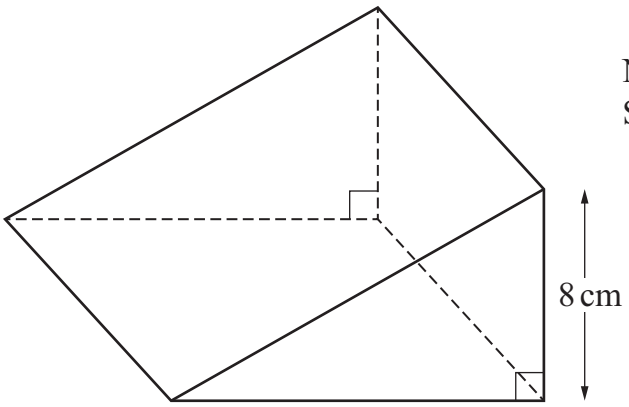
26 The diagram shows a solid triangular prism.



The base of the prism is a square with an area of 225 cm^2.
The height of the prism is 8 cm.

Calculate the total surface area of the prism.

..... cm^2 [4]

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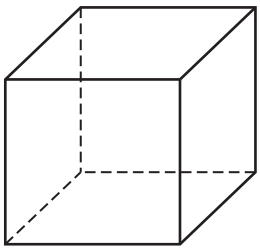
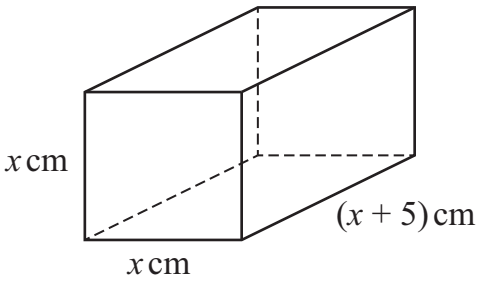
27 The cube and the cuboid have equal volumes.





NOT TO SCALE

Find an expression for the side length of the cube.

..... cm [2]

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