Cambridge Assessment International Education

Mathematics

Stage 8

Paper 2 **2023**

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

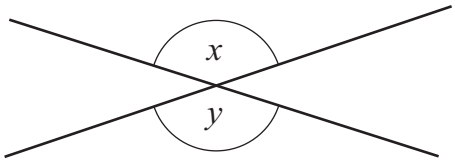
- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

1 The value of Eva's car is $9000
This value decreases by 15%.

Work out the new value of Eva's car.

$ ..... [2]

2 The diagram shows two vertically opposite angles formed where two lines intersect.



Angle x and angle y are obtuse angles.

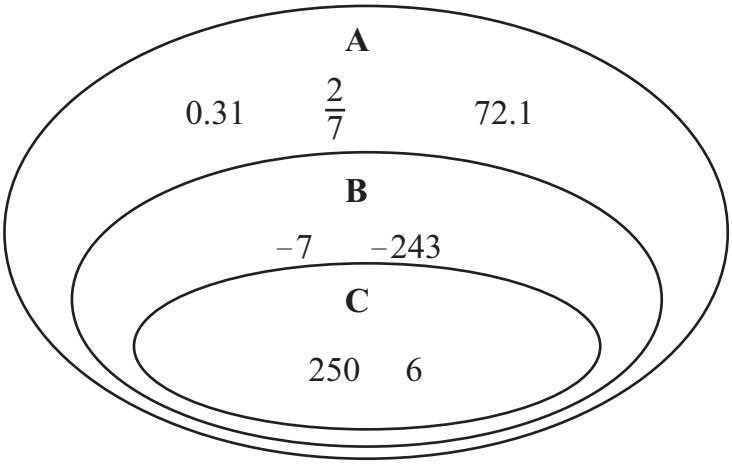
Write down one possible pair of values for angle x and angle y.

$x =$ ..... °

$y =$ ..... °

[1]

3 Here is a Venn diagram with sets A, B and C.



Choose the correct words from this list to describe each of the sets.

natural numbers rational numbers integers

A = ...

B = ...

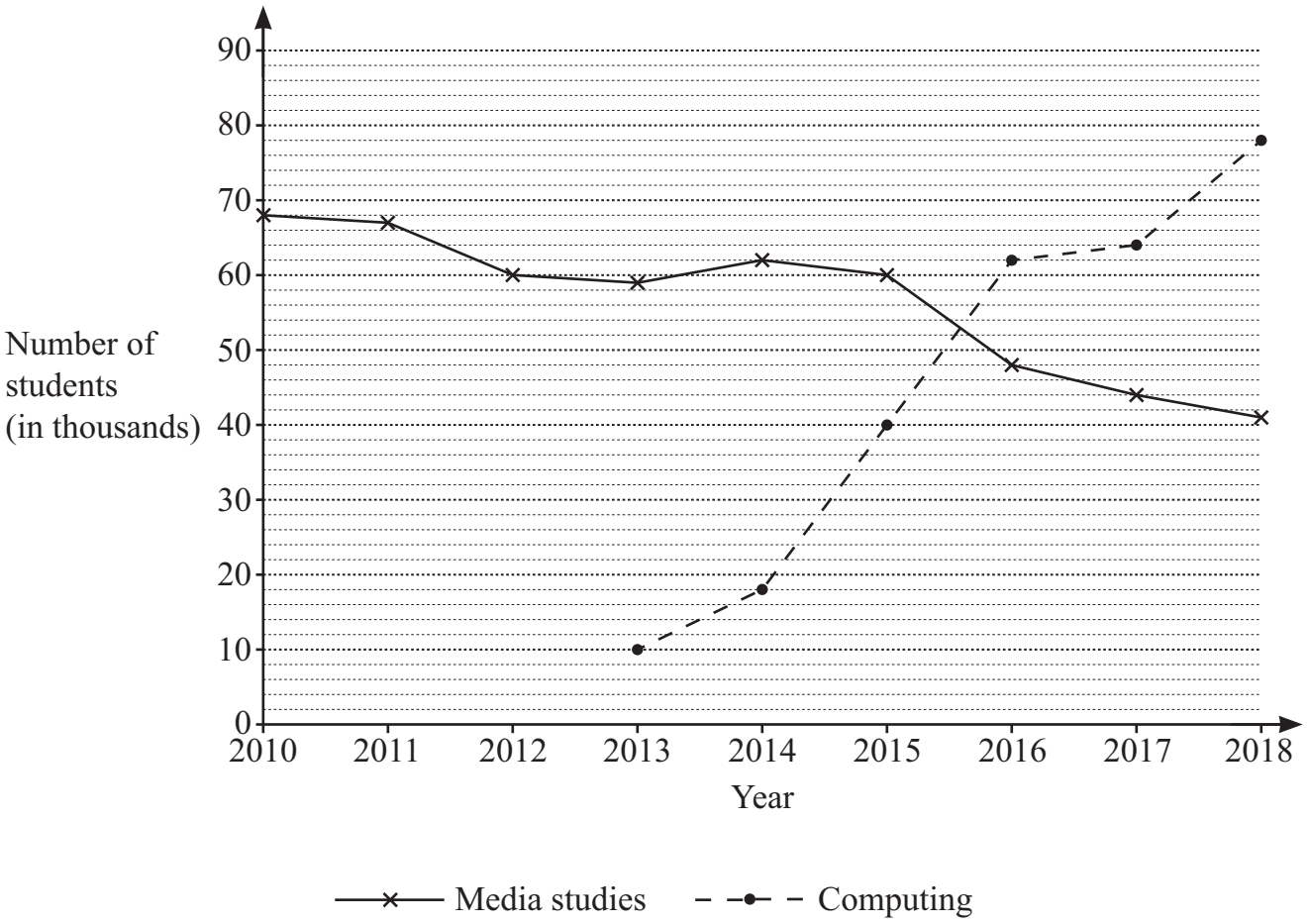
C = ...

[1]

4 Draw a bearing of 075° from point X.

[1]

5 The time-series graph shows information about the number of students studying media studies or computing.



Complete these sentences.
The first one has been done for you.

The trend in the number of students studying media studies is decreasing .

The computing course was first studied in the year ..... .

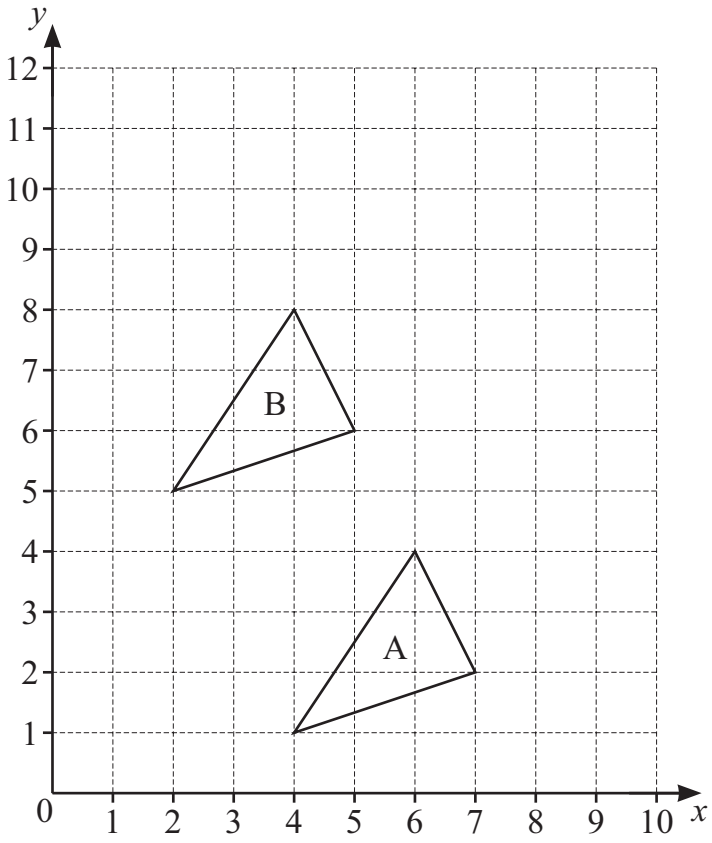
The trend in the number of students studying computing is ..... .

In the year 2015 there were ..... thousand more students studying media studies than computing.

In the year ..... there were 37 000 more students studying computing than media studies.

[2]

6 The diagram shows two triangles drawn on a grid.



(a) Write down the vector that translates triangle A onto triangle B.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$

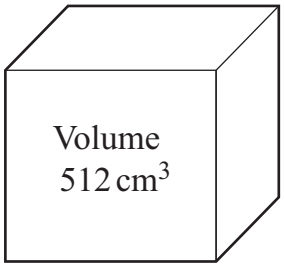
[1]

(b) On the grid, draw the image of **triangle B** after a translation by vector $\begin{pmatrix} 4 \\ 0 \end{pmatrix}$.

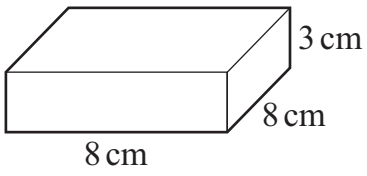
[1]

7 Here is some information about three shapes made using cubes and cuboids.

Shape A: cube

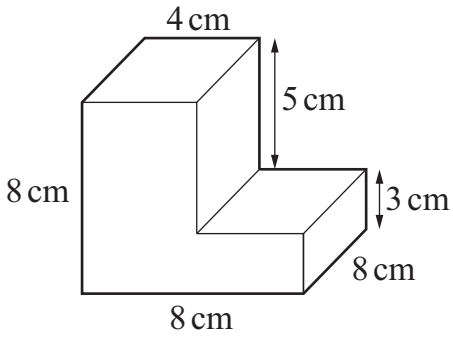


Shape B: cuboid



Shape C:
made by joining shape B
to another cuboid

NOT TO SCALE



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

	True	False
Shape A and shape C have the same height, 8 cm.	☐	☐
Shape C has a greater surface area than shape B.	☐	☐
Shape A has the greatest volume.	☐	☐
Shape B has the smallest volume.	☐	☐

[2]

8 Write each ratio in its simplest form.

(a) 550 cm : 2.25 m

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

(b) 115 : 46 : 161

..... : ..... : ..... [1]

9 Rearrange each formula to make x the subject.

(a) $r = x + 5$

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

(b) $y = \dfrac{7+x}{2p+3}$

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

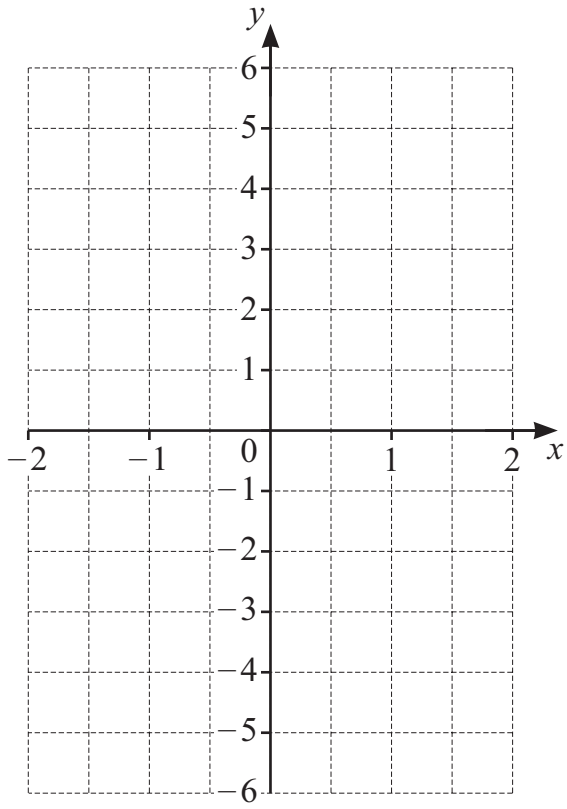
10 Complete the table.

Number	Number given correct to 3 significant figures
806 317	
0.070054	
3.995	

[2]

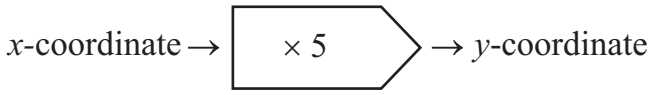
11 Complete the table for $y = 1 - 2x$ and draw the graph of $y = 1 - 2x$ on the grid.

x	–2		2
y		3	



[3]

12 Angelique uses this function machine to work out coordinates of points on a line.



Write each of these coordinates in the correct place in the table.
One has been done for you.

(5, 1) (–10, 50) (–1, –5) (5, 10) (2.5, 12.5) (2, 10)

	On Angelique's line	**Not** on Angelique's line
Below the line $y = 10$		(5, 1)
On the line $y = 10$		
Above the line $y = 10$		

[2]

13 The angles in a quadrilateral are in the ratio 3 : 6 : 7 : 2

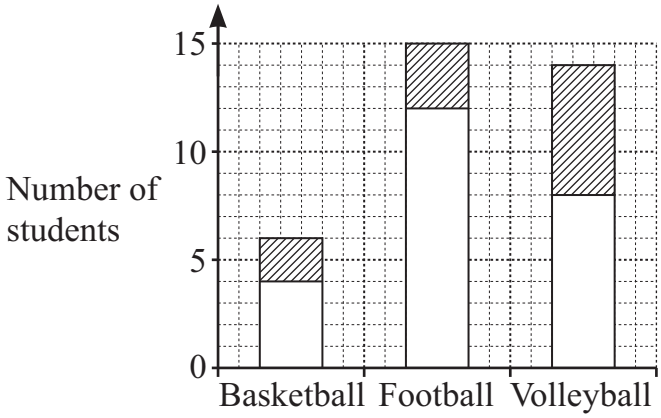
Work out the size of the largest angle in this quadrilateral.

..... ° [2]

14 The table shows the favourite sports for a group of students.

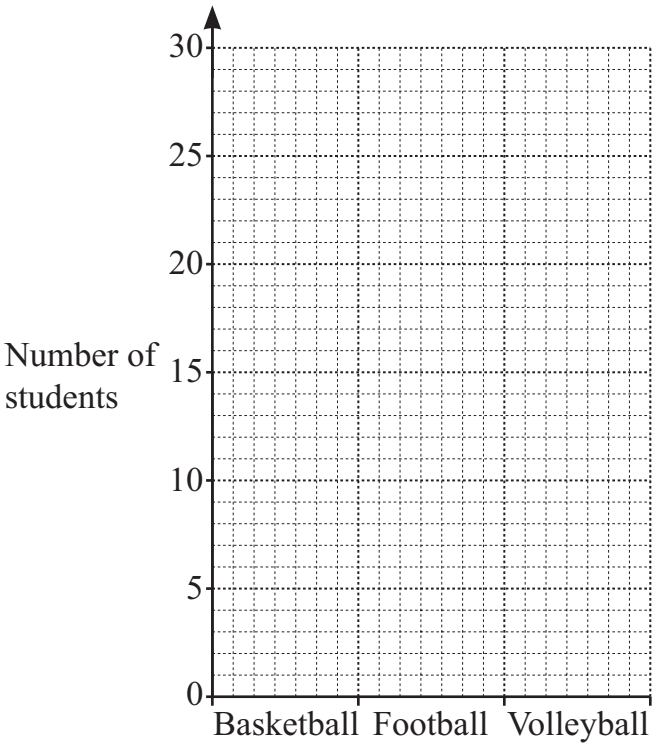
	Basketball	**Football**	**Volleyball**
Number of girls	4	12	8
Number of boys	6	15	14

Safia draws this compound bar chart to represent the information.



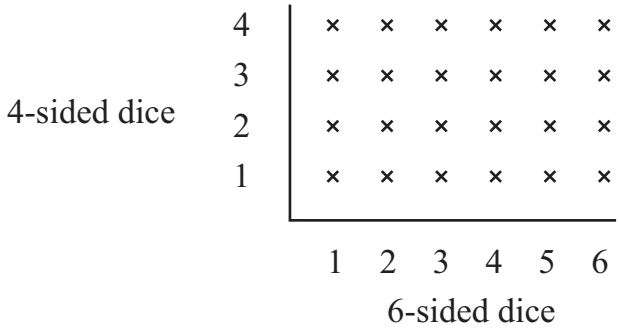
Safia has made some mistakes.

Draw the compound bar chart correctly.



[3]

15 Oliver has a fair dice with 4 faces numbered 1 to 4
He also has a fair dice with 6 faces numbered 1 to 6
He draws this possibility diagram to represent the outcomes of rolling both dice.



Find the probability of rolling a different number on each dice.

..... [1]

16 Solve.

$8x = 52 - 4(x - 2)$

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

17 Pierre wants to investigate the favourite hobbies of students in his year group at school.

(a) There are 100 girls and 120 boys in his year group at school.
Pierre decides to sample 20 girls and 24 boys rather than the same number of girls and boys.

Write down a reason to support Pierre's decision.

.....

..... [1]

(b) Pierre decides to give the students in his sample a questionnaire instead of interviewing them.

Write down a reason why this may **not** be a good decision.

.....

..... [1]

(c) Pierre wants to use a fair sampling method to randomly select the 20 girls.

Put a tick (✓) next to the sampling method that is the most likely to be random and fair.

Choose the youngest 20 girls.	☐
Choose the first 20 girls he sees coming into school.	☐
Put the names of all the girls in a hat and pick 20 names out of the hat without looking.	☐
One class in the school has 20 girls in it. Choose all of the girls in this class.	☐

[1]

18 Yuri has two boxes containing red, black and blue pens only.

Box A contains 3 red pens, 5 black pens and 2 blue pens.
Box B contains 2 red pens, 2 black pens and 1 blue pen.

Yuri picks a pen from one of the boxes at random.

(a) Yuri thinks the probability that the pen will be green is 0

Explain why Yuri is correct.

.....

..... [1]

(b) Yuri says,

'I am more likely to pick a red pen from box A than from box B because there are more red pens in box A than box B.'

Explain why Yuri is **not** correct.

.....

..... [1]

19 The edge of a square has a length of 23.8 cm.
The perimeter of this square is equal in length to the circumference of a circle.

Work out the radius of the circle.

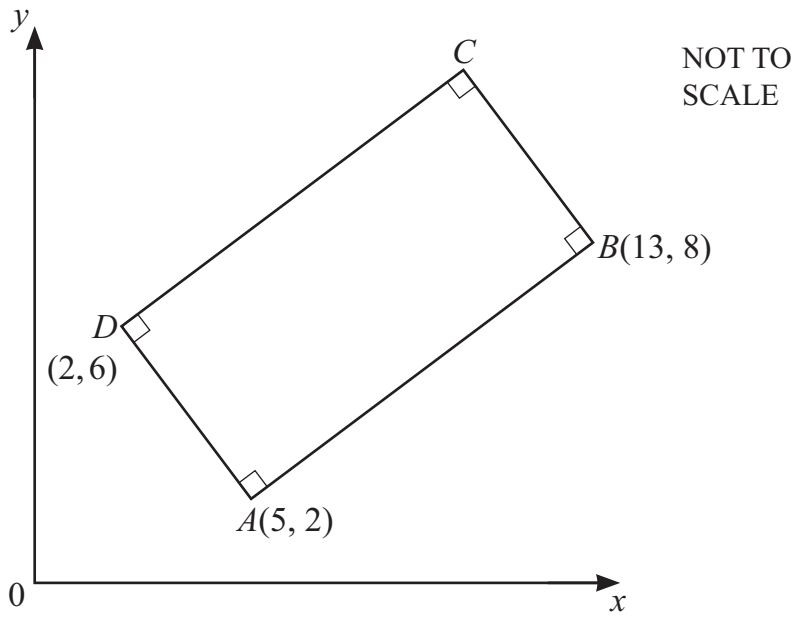
..... cm [3]

20 An expression for the area of this rectangle is $12h^2 + 15h$

Find an expression for the length of the rectangle.
Give your answer in its simplest form.

..... [1]

21 The diagram shows a rectangle $ABCD$ drawn on coordinate axes.



Work out the midpoint of line AC.

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

22 Samira has a bag containing coloured balls.
Some of the balls are red.
The number of balls in the bag that are **not** red is four times the number of red balls.
Samira picks a ball at random from the bag.

Work out the probability the ball is red.

..... [1]

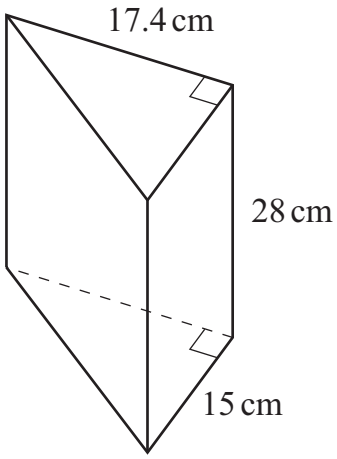
23 Here are the first four terms of a linear sequence.

3.1, 2.3, 1.5, 0.7

Find the nth term of this sequence.

..... [2]

24 The diagram shows a container in the shape of a triangular prism.
The cross section is a right-angled triangle.
The container is completely filled with water.



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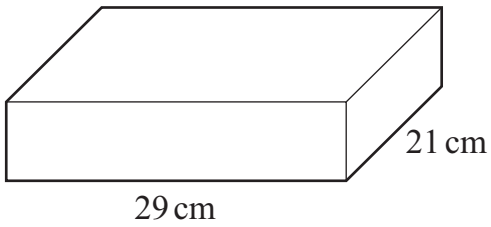
The water is then poured into the cuboid-shaped tray in the second diagram.
The water completely fills the tray.



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Find the height of the tray.

..... cm [4]