Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9431172002

MATHEMATICS **0862/01**

Paper 1 **October 2023**

1 hour

You must answer on the question paper.

You will need: Geometrical instruments
Tracing paper (optional)

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 show all your working in the booklet.
- You are **not** allowed to use a calculator.

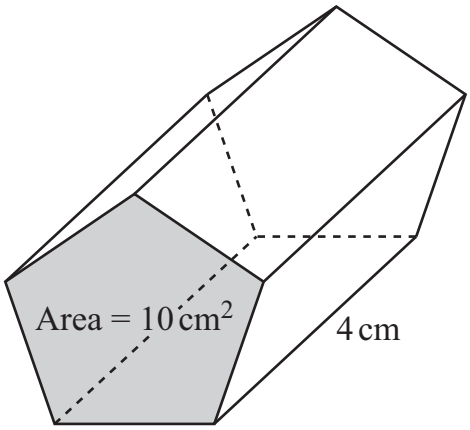
INFORMATION

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

This document has **16** pages.

IB23 10_0862_01/7RP

1 The area of the cross-section of a prism is $10\,cm^2$.
The length of the prism is 4 cm.



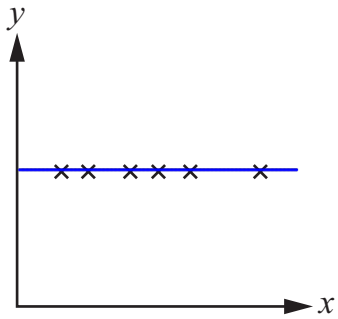
NOT TO SCALE

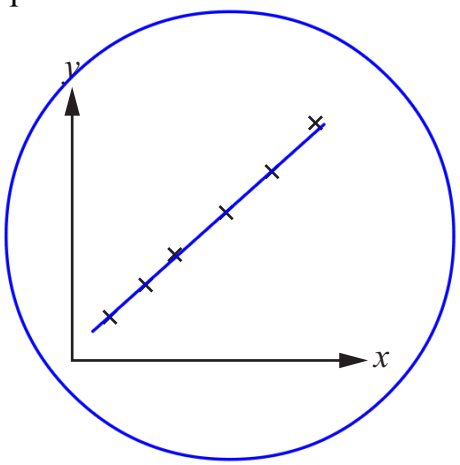
Calculate the volume of the prism.

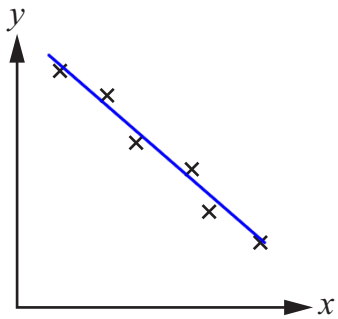
10 x 4 = 40

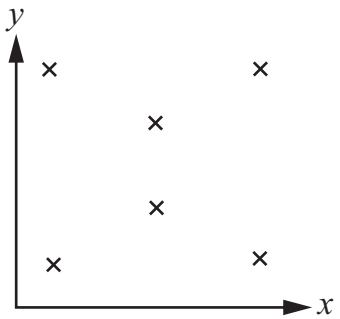
40 cm³ [1]

2 Draw a ring around the scatter graph that shows positive correlation.









[1]

3 Write each of these expressions in the correct column in the table.

4^3 $(-2)^3 = -8$ $\sqrt[3]{-8} = -2$ $(-5)^2 = 25$

One has been done for you.

Equivalent to a natural number	Not equivalent to a natural number
4^3 $(-5)^2$	$(-2)^3$ $\sqrt[3]{-8}$

[1]

4 Complete each statement using one of these symbols.

$<$ or $>$

One has been done for you.

$20 \div 1\frac{1}{2}$ ..... $<$ 20

$20 \times \frac{3}{4}$ ..... $<$ 20

$20 \times 2\frac{1}{5}$ ..... $>$ 20

$20 \div \frac{1}{5}$ ..... $>$ 20

[1]

5 Solve.

$\frac{36}{t} = 4$

$t = \frac{36}{4} = 9$

$t =$ 9 [1]

6 Calculate.

$$1-\left(\frac{9}{8}-\frac{1}{2}\right)$$

$= 1 - \frac{9}{8} + \frac{1}{2}$

$= \frac{8}{8} - \frac{9}{8} + \frac{4}{8} = \frac{3}{8}$

$\frac{3}{8}$ [2]

7 Draw a ring around the statement that is true.

$3 < \sqrt{7} < 4$ $\quad$ $4 < \sqrt{18} < 5$ $\quad$ $5 < \sqrt{36} < 6$ $\quad$ $6 < \sqrt{50} < 7$

$9 < 7 < 16$ $\quad$ $16 < 18 < 25$ $\quad$ $25 < 36 < 36$ $\quad$ $36 < 50 < 49$

[1]

8 Jamila works out an estimate of 104.37×0.615
Her estimate is $100 \times 1 = 100$

Complete the statement to show how to work out a better estimate of 104.37×0.615

104.37×0.615 is approximately 100 × 0.5 = 50

[1]

9 A team can either win, lose or draw a game of softball.
The table shows the probability the team will win or lose a game.

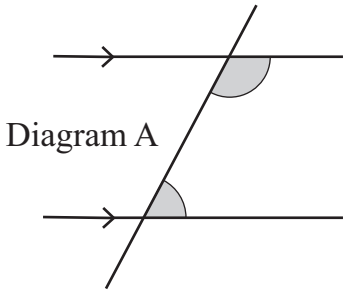
Outcome of game	Win	Lose	Draw
Probability	0.5	0.4	0.1

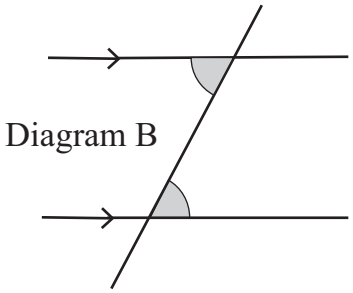
Complete the table. [1]

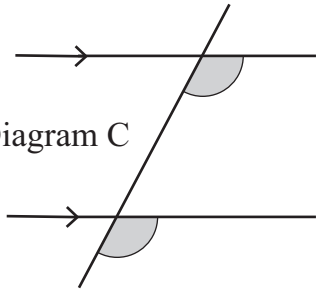
$0.5 + 0.4 + ? = 1$

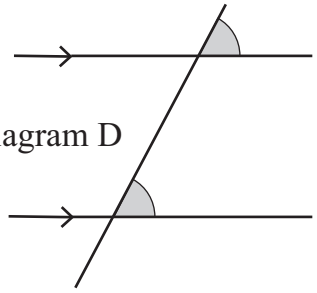
$? = 0.1$

10 Each diagram shows a pair of angles on parallel lines.









Complete the table to show if each diagram shows a pair of corresponding angles or not. One has been done for you.

Corresponding angles	Not corresponding angles
C D	A B

[1]

11 **(a)** Write 7 000 000 in standard form.

7×10^6 [1]

(b) Write these numbers in order of size, starting with the smallest.

5.5×10^4 6.4×10^{-1} 5.5×10^{-1}

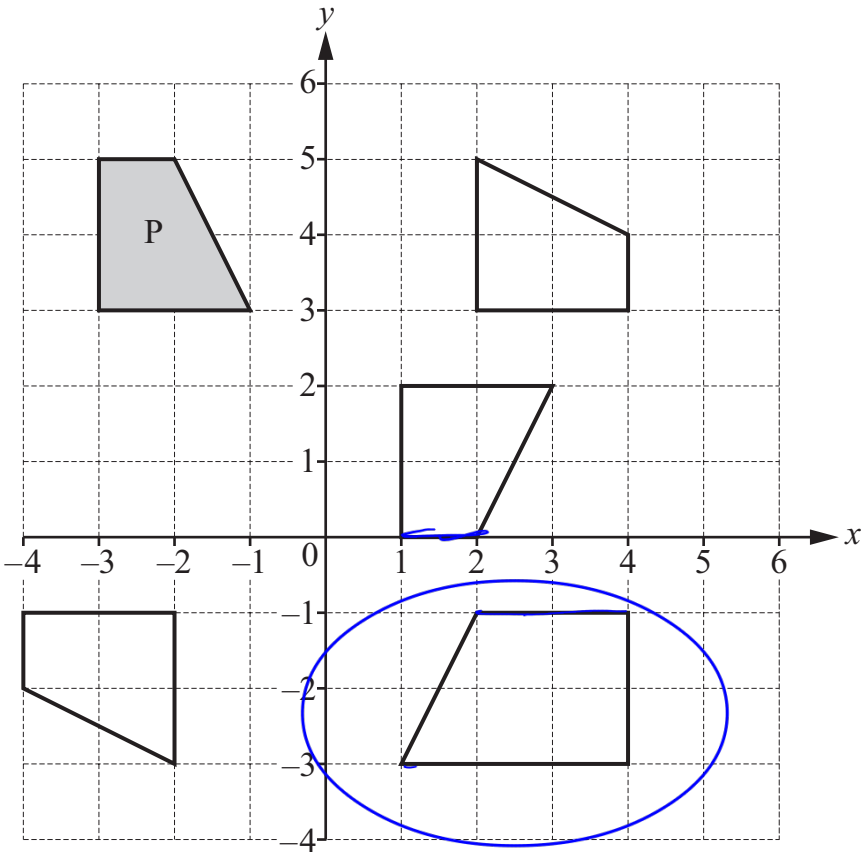
55000 0.64 0.55

5.5×10^{-1} 6.4×10^{-1} 5.5×10^4

smallest largest

[1]

12 Five quadrilaterals are shown on the grid.



Quadrilateral P is transformed by a reflection followed by a translation.

Draw a ring around the unshaded quadrilateral that is **not** a possible image of quadrilateral P.

[1]

13 **(a)** Tick (✓) to show each fraction that is equivalent to a **recurring** decimal.

$\frac{1}{6}$	✓
$\frac{6}{8}$	
$\frac{4}{12}$	✓

[1]

(b) n is an integer where $0 < n < 15$

$\frac{n}{15}$ is equivalent to a **terminating** decimal.

$n = 1, 2 \ldots\ldots 14$

$\frac{1}{15}$

Draw a ring around the number of possible values of n.

0 1 2 (4)

$0.0666\ldots$

$15 \overline{)\ 1}$

100

100

100

[1]

14 The table shows some powers of 7 and their final digit.

Power of 7	Value	Final digit
7^1	7	7
7^2	49	9
7^3	343	3
7^4	2401	1
7^5	16 807	7
7^6	117 649	9
7^7	823 543	3

7^8 (1)

(a) The final digit of 7^n is 1

Write down a possible value of n if $n > 7$

8 [1]

(b) Use patterns in the table to find the final digit of 7^{22}

$n =$ 1 2 3 4 | 6 7 8 9 | . . . | 17 18 19 20 | 21 22

Last digit: 7 9 3 1 | 7 9 3 1 | . . . | 7 9 3 1 | 7 9

9 [1]

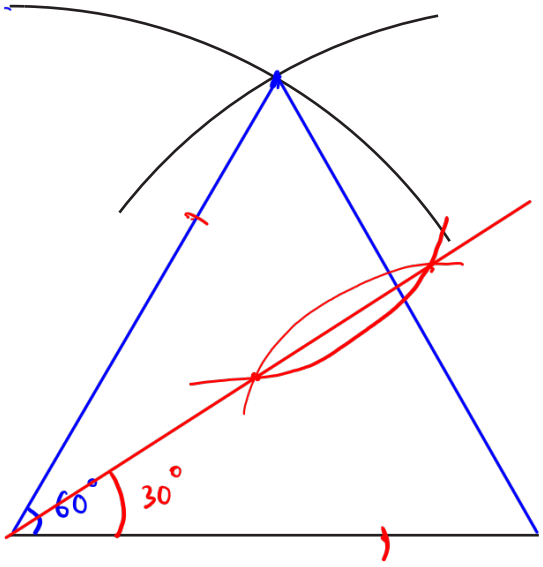
15 Calculate.

$$\frac{6 \times -1.8}{-0.2} = \frac{6 \times 1.8}{0.2} = \frac{6 \times 18}{2} = 6 \times 9 = 54$$

54 [2]

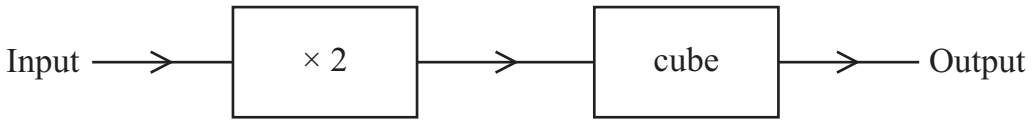
16 Construct an angle of 30°.

The construction has been started for you.



[2]

17 A function is defined by this function machine.



(a) Complete the table.

Input	Output
5	1000
$\frac{3}{2}$	27

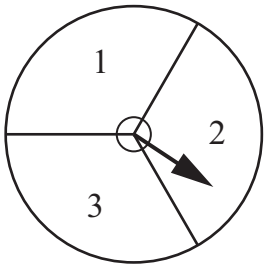
[2]

(b) Calculate the **input** when the output is −64

$\frac{\sqrt[3]{-64}}{2} = \frac{-4}{2} = -2$

−2 [2]

18 Pierre spins this fair spinner twice.



	1	2	3
1	2	3	4
2	3	4	5
3	4	5	6

He adds together his two numbers to get a total.
Pierre makes two statements.

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

	True	False
The possible totals are 2, 3, 4, 5 and 6	✓	
P(total is 3) = $\frac{1}{5}$		✓

$\frac{2}{9}$

[1]

19 Solve.

$2x - y = 17$ (1)

$x + 3y = -2$ (2)

$2x + 6y = -4$ (3)

Take (1) − (3)

$-y - 6y = 17 - (-4)$

$-7y = 21$

$y = -3$

$2x - (-3) = 17$

$2x = 14$

$x = 7$

$x =$ 7

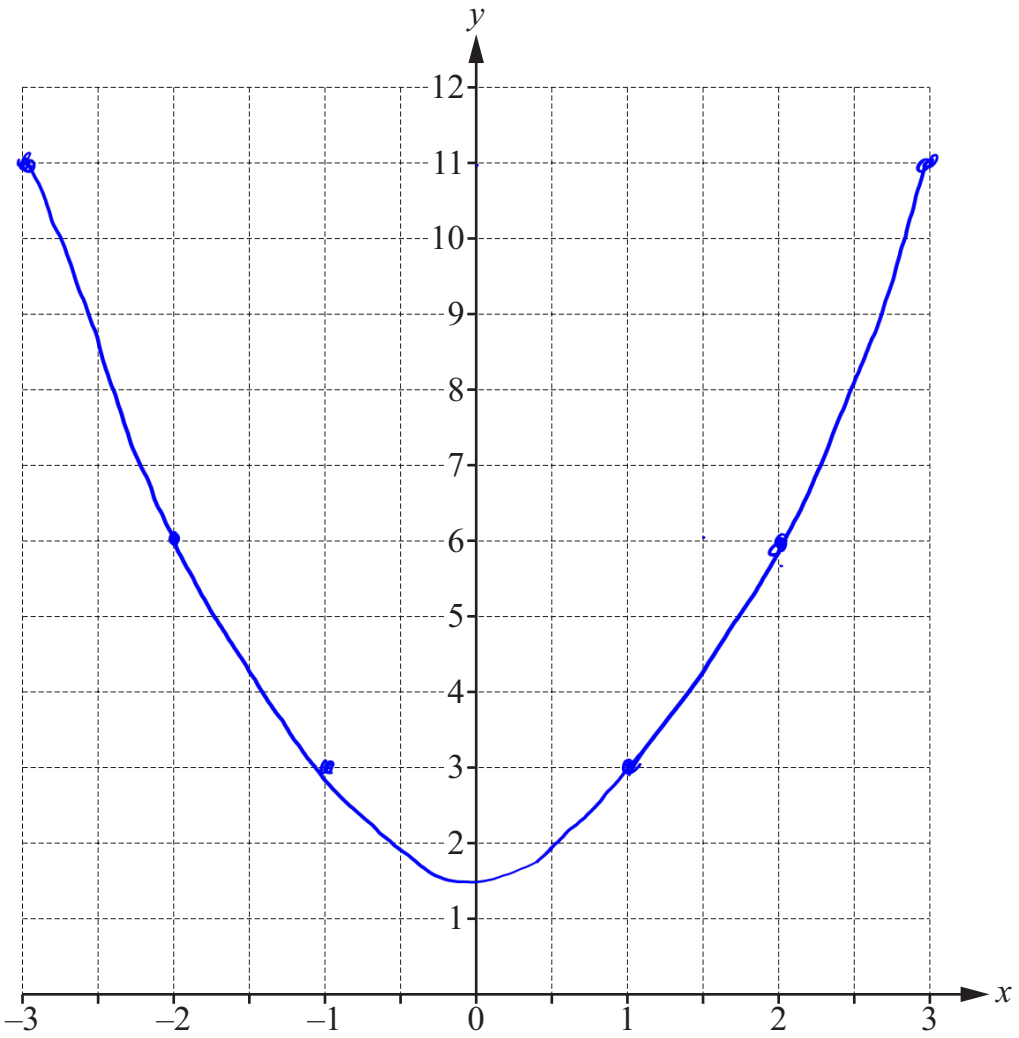
$y =$ −3

[3]

20 Draw the graph of $y = x^2 + 2$ for values of x between –3 and 3

You may use the table to help you.

x	–3	–2	–1	0	1	2	3
y	11	6	3	2	3	6	11



[3]

21 A quadrilateral has an area of 5 cm^2.

The quadrilateral is enlarged by scale factor 4

Calculate the area of the enlarged quadrilateral.

$5 \times 4^2 = 80$

80 cm^2 [2]

22 There are 20 children in Class A and 20 children in Class B.
Each child completes a test.

The back-to-back stem-and-leaf diagram shows some of the marks scored by the children.
The highest mark for Class B is **not** included.

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

Key: 4 | **1** | 0 represents a mark of 14 in Class A and 10 in Class B

(a) The range of marks for Class A is the same as the range of marks for Class B.

Complete the diagram for **Class B** by writing in the highest mark.

$\text{Range}_A = 56 - 14 = 42$

$\text{Range}_B = ? - 8 = 42$

$? = 42 + 8 = 50$

[2]

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

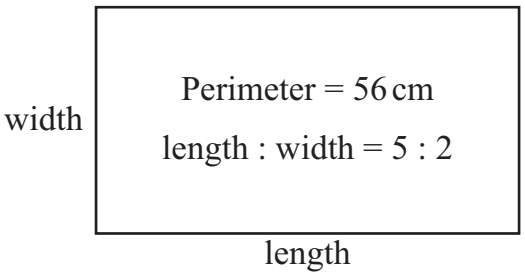
	True	False
A total of 5 students in the two classes scored less than 15 marks.	✓	
The modal mark for Class A is greater than the modal mark for Class B.	✓	

[1]

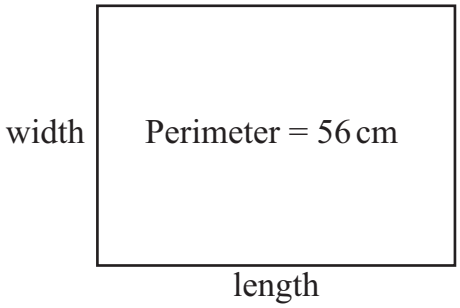
23 The diagram shows some information about two rectangles.

NOT TO SCALE

Rectangle A



Rectangle B



The length of rectangle B is 2.5 cm **less** than the length of rectangle A.

Calculate the ratio length : width for rectangle B.
Give your answer in its simplest form.

$l_A : w_A = 5 : 2 \rightarrow l_A = \frac{5}{2} w_A \quad (1)$

$2 \times (l_A + w_A) = 56 \quad (2)$

Plug (1) into (2): $2\left(\frac{5}{2} w_A + w_A\right) = 56$

$5 w_A + 2 w_A = 56$

$7 w_A = 56$

$w_A = 8 \text{ (cm)}$

$l_A = \frac{5}{2} \times 8 = 20 \text{ (cm)}$

$l_B = 20 - 2.5 = 17.5 \text{ (cm)}$

$2 \times (l_B + w_B) = 56$

$17.5 + w_B = 28$

$w_B = 10.5$

$l_B : w_B = 17.5 : 10.5 = 5 : 3$

..... 5 : 3 ..... [3]

24 The term-to-term rule of a sequence is multiply by 2
The first term of the sequence is a.
The sum of the first term and the third term is 35

Work out the sum of the first **two** terms.

1st	2nd	3rd
a	$2a$	$4a$

$a + 4a = 35$

$5a = 35$

$a = 7$

Sum of the first 2 terms: $a + 2a = 3a = 3 \times 7 = 21$

21 [3]

25 $0.45 \times 10^p = 4500$ and $5070 \times 10^q = 0.0507$

Find the value of $0.038 \div 10^{p+2q}$

$10^p = \frac{4500}{0.45} = 10000$

$p = 4$

$10^q = \frac{0.0507}{5070} = 10^{-5}$

$q = -5$

$0.038 \div 10^{4+2\times(-5)} = 0.038 \div 10^{-6}$

$= 38000$

38 000 [2]

26 A polygon has 7 sides.

The mean of the sizes of the 6 smallest angles in the polygon is 115°.

Calculate the size of the largest angle.

Sum of 7 angles : $(7-2) \times 180^\circ = 900^\circ$

Largest angle : $900^\circ - 115^\circ \times 6$

$= 900^\circ - 690^\circ$

$= 210^\circ$

.....210..... ° [3]

27 The solution, x, to the equation $4x = 12 - px$ is an integer.

p is a positive integer.

Find a possible value of p.

$4x + px = 12$

$(4+p)x = 12$

$x = \frac{12}{4+p}$

x is an integer → $12 \div (4+p)$

.....2..... [1]