Given name/s

Family name

Teacher

Class

School name

Common internal assessment 2024 — Phase 1

Question and response book

Essential Mathematics

Time allowed

- Perusal time — 5 minutes
- Working time — 60 minutes

General instructions

- Answer all questions in this question and response book.
- Write using black or blue pen.
- QCAA-approved calculator permitted.
- Ruler required.
- QCAA formula book provided.
- Planning paper will not be marked.

Part A: Simple (40 marks)

- 9 short response questions

Part B: Complex (10 marks)

- 2 short response questions

Clear zone — margin trimmed off after completion of assessment

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Instructions

- Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
- If you need more space for a response, use the additional pages at the back of this book.
  - On the additional pages, write the question number you are responding to.
  - Cancel any incorrect response by ruling a single diagonal line through your work.
  - Write the page number of your alternative/additional response, i.e. See page …
  - If you do not do this, your original response will be marked.

Part A: Simple

- This part has nine questions and is worth 40 marks.

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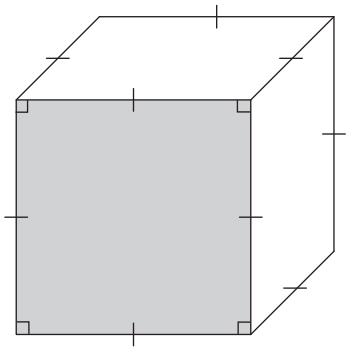
QUESTION 1 (2 marks)

A cube-shaped storage container is shown.

Not to scale



a) Name the shape of the shaded face. *[1 mark]*

b) How many vertices does the container have? *[1 mark]*

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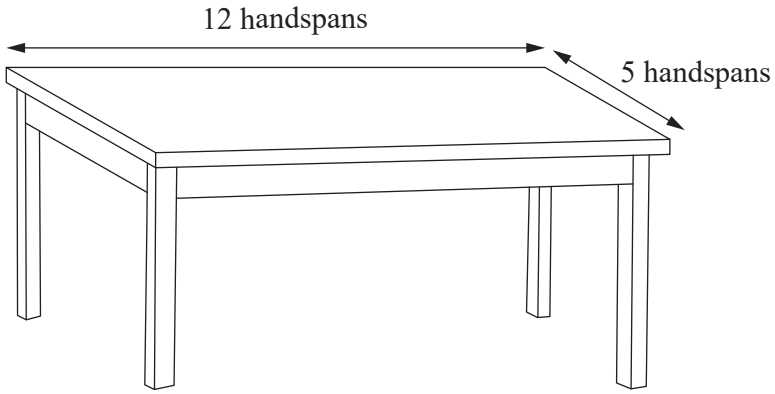
QUESTION 2 (3 marks)

A furniture store customer uses their handspan to measure the length and width of a tabletop.

Not to scale



a) Determine the perimeter of the tabletop in handspans. *[1 mark]*

The customer's handspan is 21 cm.

b) Use your result from Question 2a) to calculate the perimeter of the tabletop in metres. *[2 marks]*

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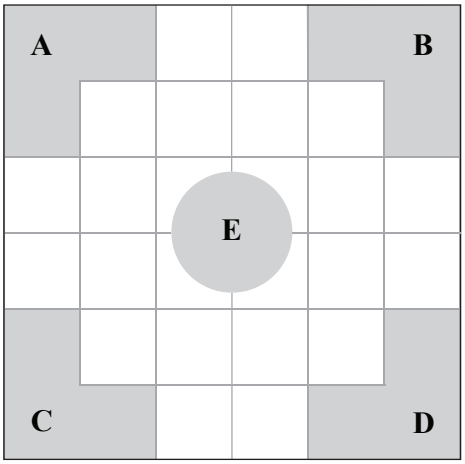
QUESTION 3 (4 marks)

The location of five office desks (A, B, C, D and E) is shown on the floor plan.



Key: = 1 m^2

a) Determine the actual area of desk A in square metres. *[1 mark]*

b) Estimate the actual area of desk E in square metres. *[1 mark]*

c) Use your results from Questions 3a) and 3b) to calculate the approximate total actual area occupied by all five office desks in square metres. *[2 marks]*

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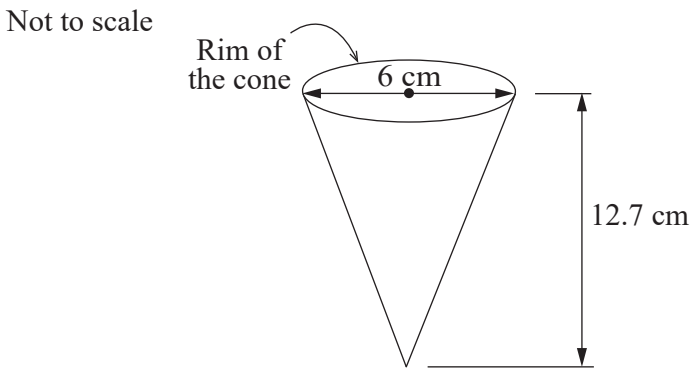
QUESTION 4 (6 marks)

An ice-cream cone is filled to the rim with ice cream, as shown.



a) Determine the radius of the rim of the cone in centimetres. *[1 mark]*

b) What is the perpendicular height of the cone in centimetres when rounded using leading-digit approximation? *[1 mark]*

c) Use your results from Questions 4a) and 4b) to calculate the approximate volume of the cone in cubic centimetres. *[2 marks]*

d) Use your result from Question 4c) to estimate the amount of ice cream required to fill 20 cones to the rim in millilitres. *[2 marks]*

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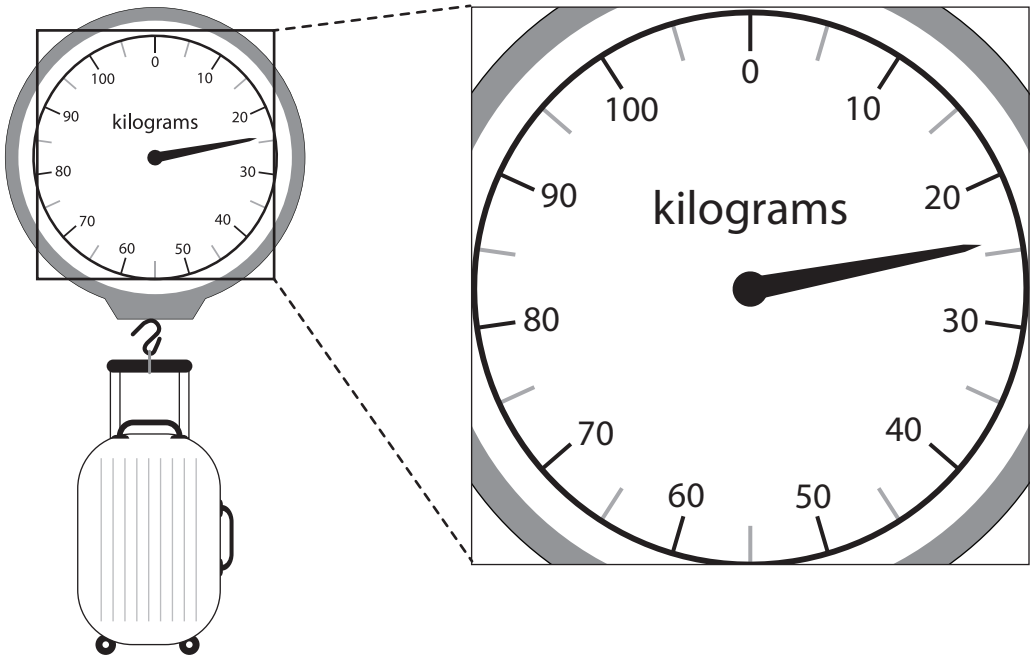
QUESTION 5 (4 marks)

The mass of a tourist's full suitcase is shown on the scales.

Not to scale



a) Estimate the mass of the full suitcase in kilograms. *[1 mark]*

A trolley is used to move suitcases from the terminal to the plane. The trolley can carry a maximum mass of 5 tonnes.

b) Convert the maximum mass the trolley can carry to kilograms. *[1 mark]*

c) Assuming all suitcases have the same mass as the tourist's full suitcase, calculate the maximum number of suitcases the trolley can carry. *[2 marks]*

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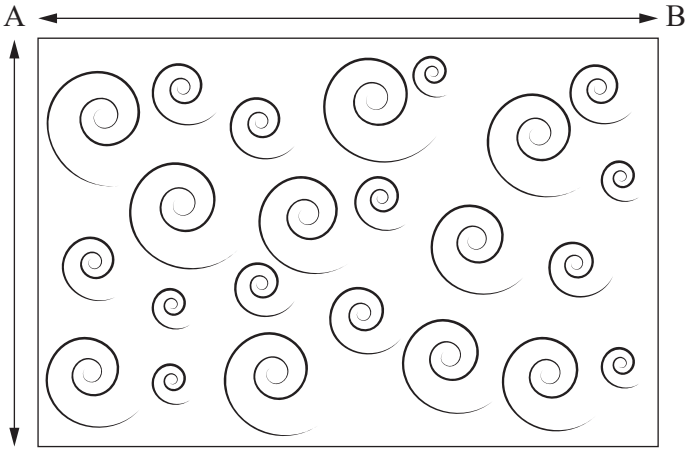
QUESTION 6 (6 marks)

The scale drawing of a rectangular painting is shown.



Scale 1:4

a) Calculate the actual length of side AB in centimetres. *[2 marks]*

b) Calculate the actual length of side AC in centimetres. *[2 marks]*

c) Use your results from Questions 6a) and 6b) to calculate the actual area of the painting, rounded to the nearest square centimetre. *[2 marks]*

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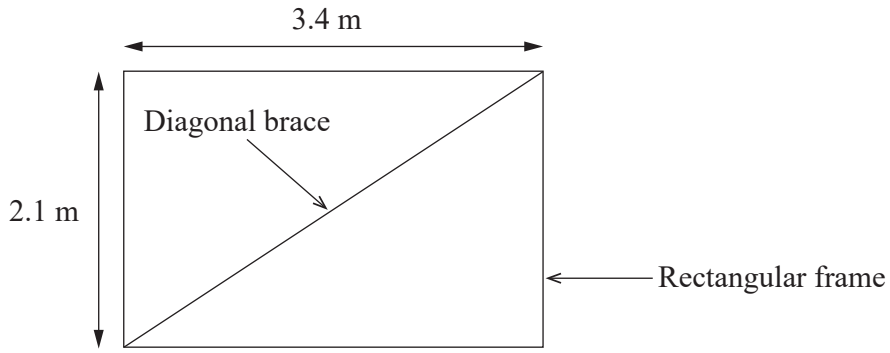
QUESTION 7 (5 marks)

A rectangular wall frame is built with a diagonal brace as shown.

Not to scale



a) Use Pythagoras' theorem to calculate the length of the diagonal brace in metres. *[3 marks]*

b) Determine the total length of timber required to build the frame, including the diagonal brace, in metres. *[2 marks]*

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QUESTION 8 (5 marks)

The temperatures, in degrees Celsius (°C), for 13 towns on the first day of spring are shown.

Stem	Leaf
1	6 8
2	0 1 2 2 4
2	5 5 5 6
3	0 0

Key: 1 | 6 = 16 °C

a) Identify the modal temperature. *[1 mark]*

b) Determine the median temperature. *[1 mark]*

c) Calculate the mean temperature. *[2 marks]*

d) Describe the spread of the data. *[1 mark]*

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QUESTION 9 (5 marks)

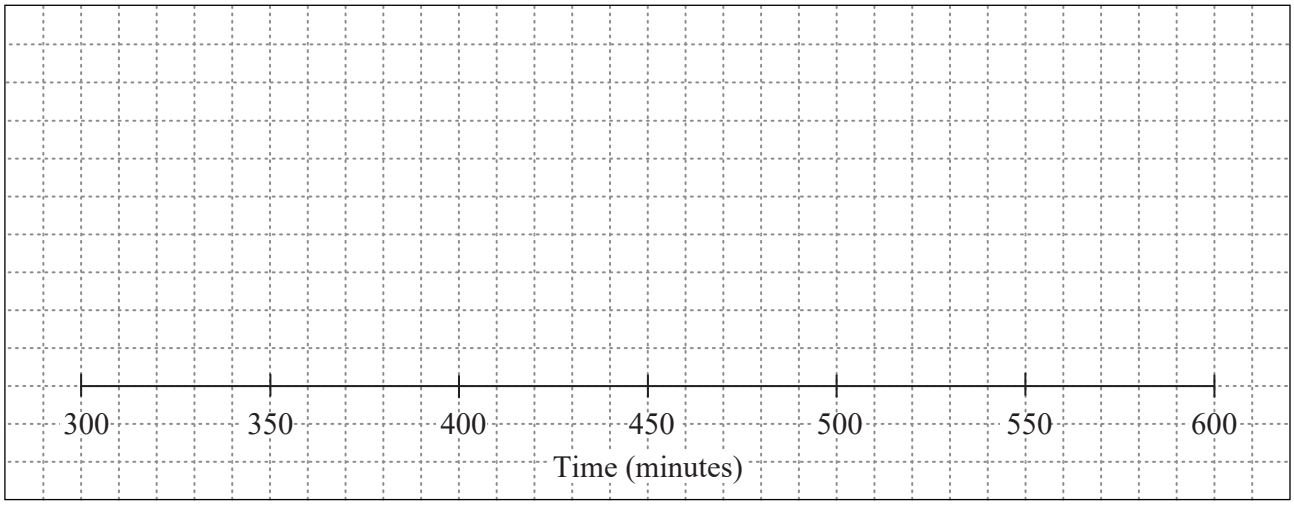
The data shows the time (minutes) a person spent using technology each day.

Time (min)	340	400	540	310	560	460	600	390	380

a) Complete the five-number summary for the time spent using technology by writing an appropriate label or value in each empty cell of the table. *[3 marks]*

Minimum			Upper quartile	Maximum
	360		550	

b) Use your results from Question 9a) to construct a box plot to represent the data, using the response space provided. *[2 marks]*



Note: If you make a mistake in the box plot, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this question and response book.

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Part B: Complex

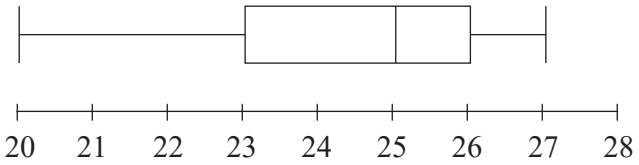
- This part has two questions and is worth 10 marks.

QUESTION 10 (5 marks)

A manager of a company is choosing between two machines that pack chocolates into boxes. They test each machine's ability to consistently pack 25 chocolates per box.

The test data summary for machine A is shown in the box plot.

Machine A



The test data for machine B is 23, 24, 24, 25, 25, 25, 25, 26, 26.

Based on the interquartile range, determine the most consistent machine.

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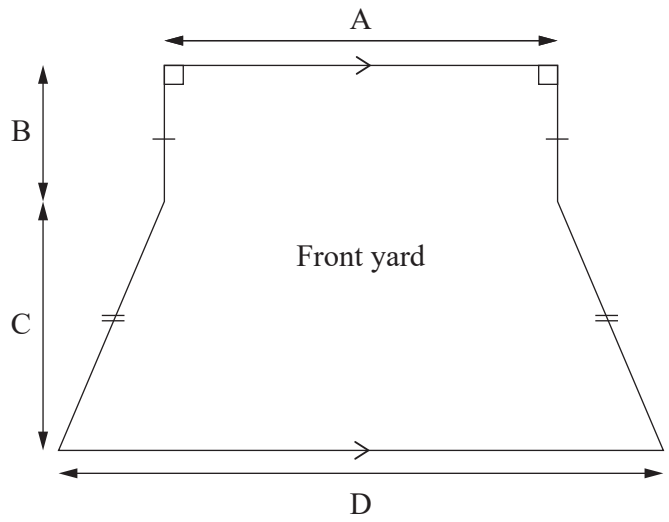
QUESTION 11 (5 marks)

Barry is laying grass for his front yard. A scale drawing of the front yard is shown.

Barry believes that 50 rolls of grass will be enough to cover the front yard. If one roll of grass covers 1.3 m^2, evaluate the reasonableness of Barry's belief.



Scale 1:150

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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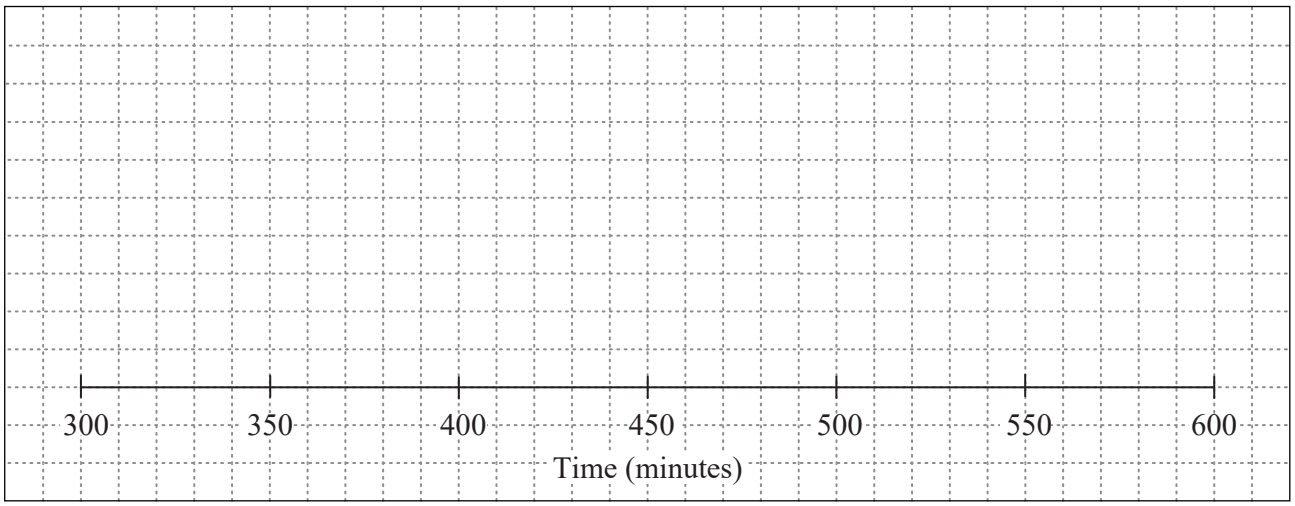

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Instrument-specific standards — Common internal assessment

Foundational knowledge and problem solving	Cut-off (marks)	Grades
The student work has the following characteristics		
• comprehensive selection, recall and use of simple and complex facts, rules, definitions and procedures; comprehension and clear communication of simple and complex mathematical concepts and techniques; evaluation of the reasonableness of solutions and use of mathematical reasoning to justify procedures and decisions; and proficient application of simple and complex mathematical concepts and techniques to solve problems	> 40	**A**
• selection, recall and use of simple and some complex facts, rules, definitions and procedures; comprehension and communication of simple and some complex mathematical concepts and techniques; evaluation of the reasonableness of some solutions using mathematical reasoning; and application of simple and some complex mathematical concepts and techniques to solve problems	> 30	**B**
• selection, recall and use of simple facts, rules, definitions and procedures; comprehension and communication of simple mathematical concepts and techniques; discussion of the reasonableness of solutions using mathematical reasoning; and application of simple mathematical concepts and techniques to solve problems	> 20	**C**
• some selection, recall and use of facts, rules, definitions and procedures; basic comprehension and communication of mathematical concepts and techniques; some discussion of the reasonableness of solutions; and inconsistent application of mathematical concepts and techniques	> 10	**D**
• isolated and inaccurate selection, recall and use of facts, rules, definitions and procedures; disjointed and unclear communication of mathematical concepts and techniques; superficial discussion of the reasonableness of solutions.	≥ 0	**E**