Given name/s

Family name

Teacher

Class

School name

Common internal assessment 2024 — Phase 2

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

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

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.

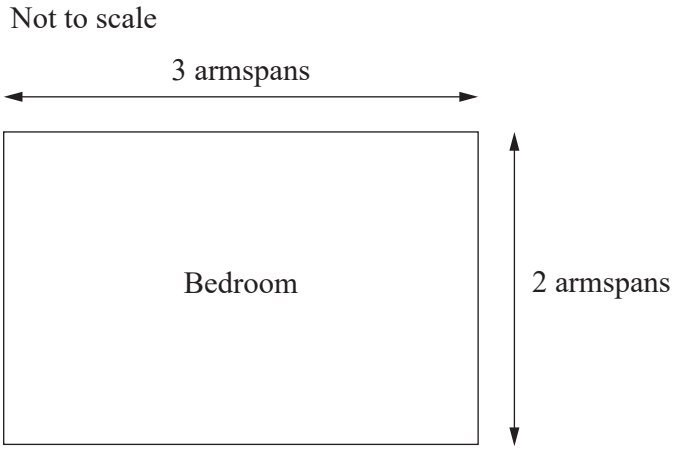
DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

Do not write outside this box.

QUESTION 1 (3 marks)

A renter uses their armspan to measure the length and width of a bedroom.



a) Determine the perimeter of the bedroom in armspans. *[1 mark]*

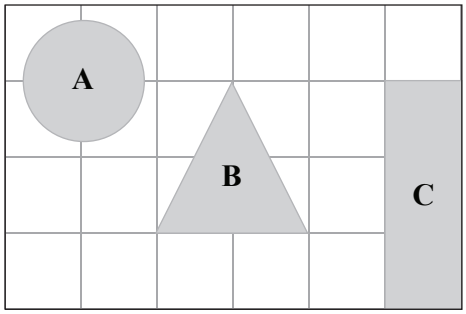
The renter's armspan is 160 cm.

b) Use your result from Question 1a) to calculate the perimeter of the bedroom in metres. *[2 marks]*

Do not write outside this box.

QUESTION 2 (4 marks)

The placement of three images (A, B and C) on a billboard is shown.



Key: = 1 m^2

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

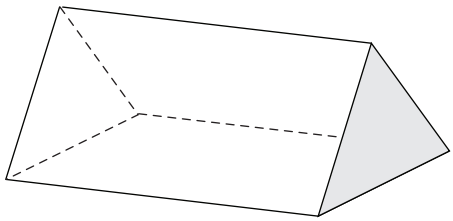
b) Estimate the actual area of image A in square metres. *[1 mark]*

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

Do not write outside this box.

QUESTION 3 (2 marks)

A jewellery store has enclosed cabinets as shown.



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

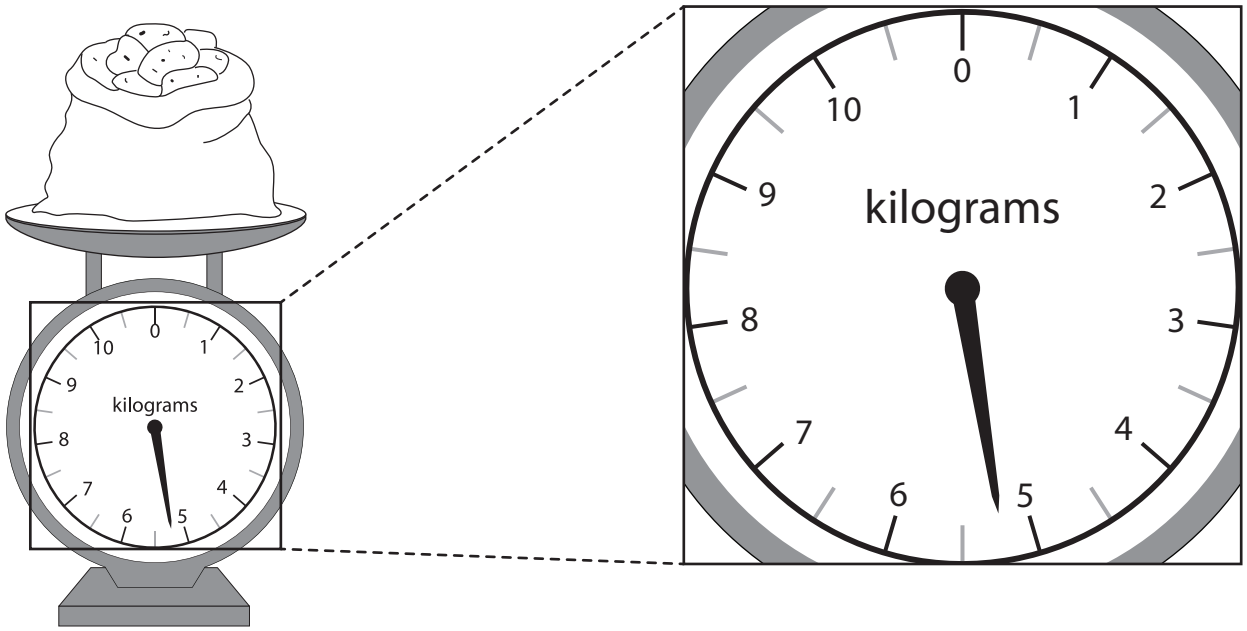
b) How many vertices does the cabinet have? *[1 mark]*

Do not write outside this box.

QUESTION 4 (4 marks)

The mass of a bag of potatoes at a local store is shown.

Not to scale



a) Estimate the mass of the bag of potatoes in kilograms. *[1 mark]*

The local store receives a maximum mass of 1.5 tonnes of potatoes in a delivery.

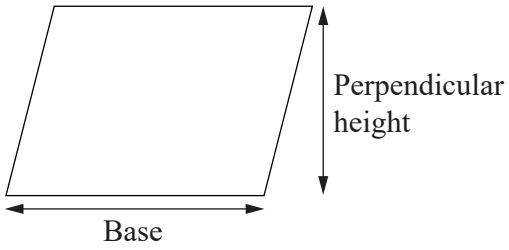
b) Convert the maximum mass of potatoes in a delivery to kilograms. *[1 mark]*

c) Assuming all bags of potatoes have the same mass, calculate the maximum number of bags of potatoes in a delivery. *[2 marks]*

Do not write outside this box.

QUESTION 5 (6 marks)

The scale drawing of a kitchen tile in the shape of a parallelogram is shown.



Scale 1:5

a) Calculate the actual perpendicular height of the tile in centimetres. *[2 marks]*

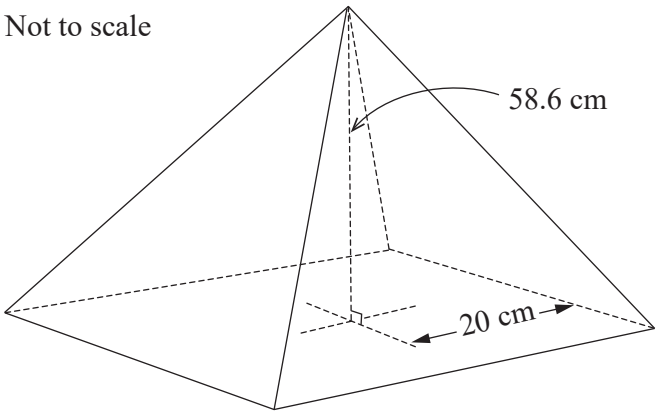
b) Calculate the actual length of the base of the tile in centimetres. *[2 marks]*

c) Use your results from Questions 5a) and 5b) to calculate the actual area of the tile, rounded to the nearest square centimetre. *[2 marks]*

Do not write outside this box.

QUESTION 6 (6 marks)

A modern art sculpture features a small squared-based pyramid filled with coloured water.



a) Determine the base length of the pyramid in centimetres. *[1 mark]*

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

c) Use your results from Questions 6a) and 6b) to calculate the approximate volume of the pyramid in cubic centimetres. *[2 marks]*

d) Use your result from Question 6c) to estimate the amount of coloured water required to fill three pyramids in millilitres. *[2 marks]*

Do not write outside this box.

QUESTION 7 (5 marks)

The times, in minutes, for 13 employees to complete the same task are shown.

Stem	Leaf
0	6
1	2 3 4
1	5 6 7 7 9
2	1 2 2 2

Key: 1 | 2 = 12 minutes

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

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

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

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

Do not write outside this box.

QUESTION 8 (5 marks)

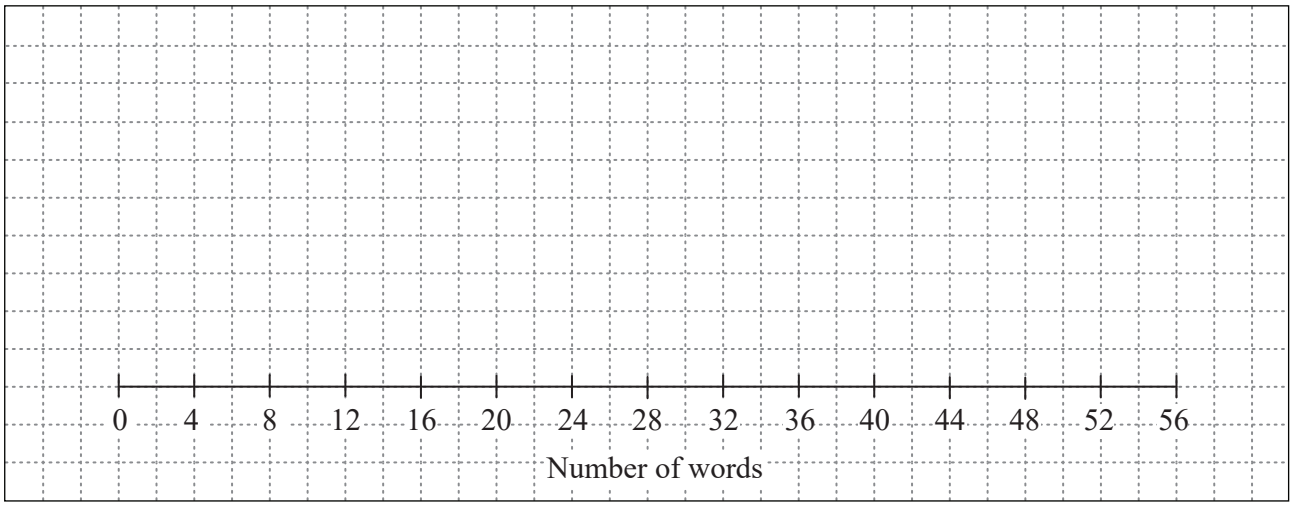
The data shows the number of words a student has learnt in a new language each week.

Number of words	26	21	20	43	4	20	52	48	53

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

Minimum	Lower quartile		Upper quartile	
	20		50	

b) Use your results from Question 8a) to construct a box plot to represent the data, using the response space provided. *[2 marks]*



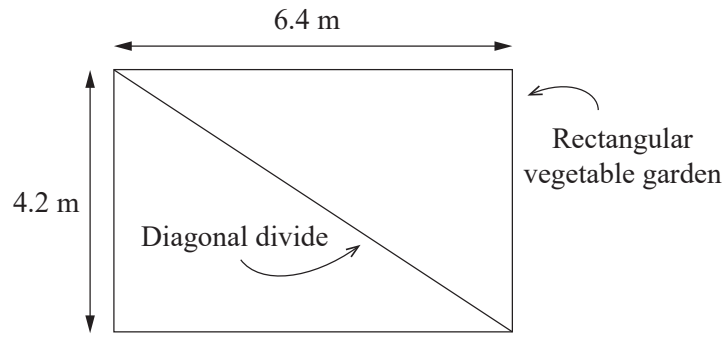
Note: If you make a mistake in the box plot, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this question and response book.

Do not write outside this box.

QUESTION 9 (5 marks)

A farmer lays irrigation pipes along the perimeter and diagonal divide of a vegetable garden as shown.

Not to scale



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

b) Determine the total length of irrigation pipe required for the vegetable garden in metres. *[2 marks]*

Do not write outside this box.

DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

CONTINUE TO THE NEXT PAGE

Part B: Complex

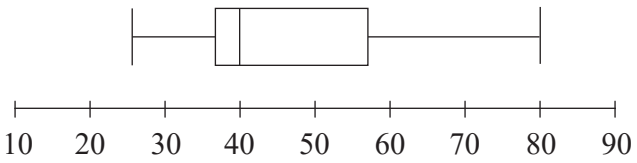
- This part has two questions and is worth 10 marks.

QUESTION 10 (5 marks)

A company is choosing between two programs to pack biscuits into boxes. They test each program's ability to consistently pack 40 biscuits per box.

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

Program A



The test data for program B is 15, 20, 20, 28, 40, 47, 50, 60, 80.

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

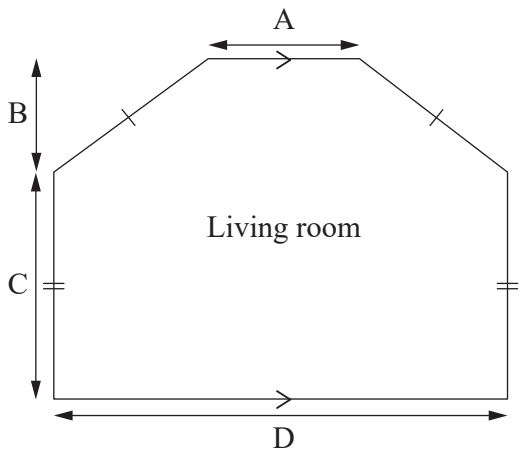
Do not write outside this box.

Do not write outside this box.

QUESTION 11 (5 marks)

Bart is repainting the floor in his living room. A scale drawing of the living room is shown.

Bart believes that four tins of paint will be enough to paint the floor. If one tin of paint covers 12 m^2, evaluate the reasonableness of Bart's belief.



Scale 1:120

Do not write outside this box.

END OF PAPER

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

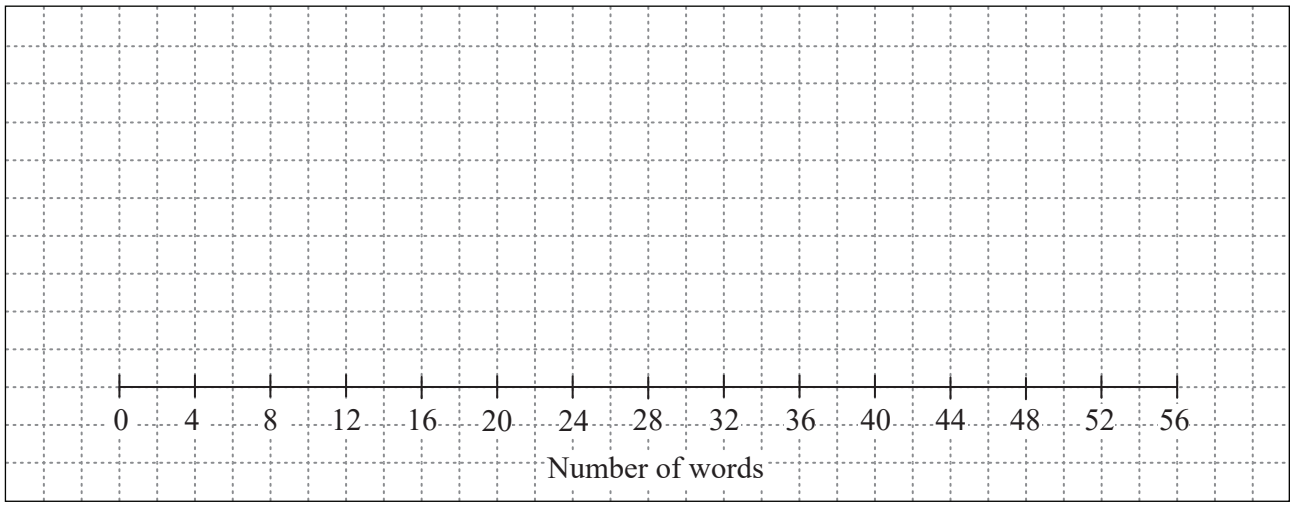
ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

If you want this page to be marked, rule a single diagonal line through your original response.



Do not write outside this box.

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**