Given name/s	
Family name	
Teacher		Class	
School name	

Common internal assessment 2024 — Ancillary phase

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

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 …
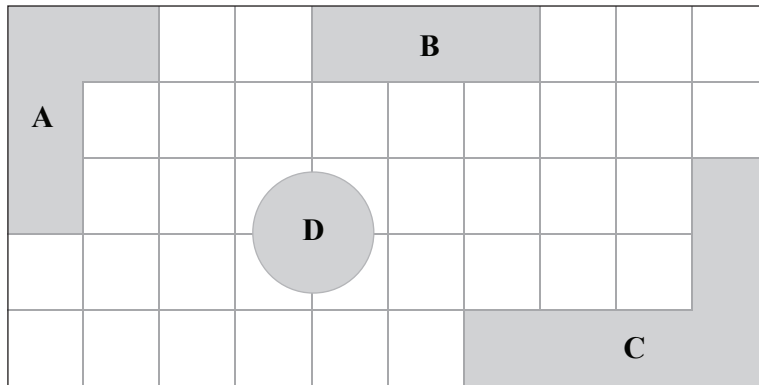 - If you do not do this, your original response will be marked.

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 (4 marks)

The placement of four garden beds (A, B, C and D) in a backyard is shown.

Key: ☐ = 1 m^2

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

_____

b) Estimate the actual area of garden bed D in square metres.   *[1 mark]*
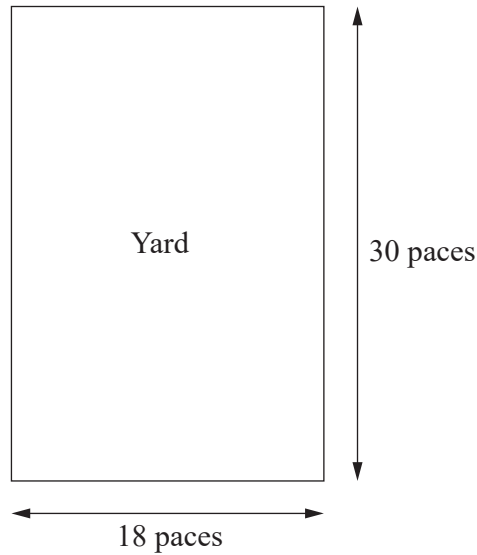
_____

c) Use your results from Questions 1a) and 1b) to calculate the approximate total
    actual area occupied by all four garden beds in square metres.   *[2 marks]*

_____

_____

_____

_____

QUESTION 2 (3 marks)

A builder paces around a yard to measure the length and width of the fence they need to build.

Not to scale

Yard

30 paces

18 paces

a) Determine the perimeter of the yard in paces. *[1 mark]*

The builder's pace is 85 cm long.

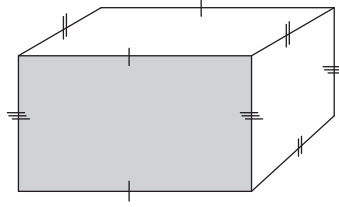b) Use your result from Question 2a) to calculate the perimeter of the yard in metres. *[2 marks]*

QUESTION 3 (2 marks)

A cake was baked in the shape of a prism, as shown.

Not to scale

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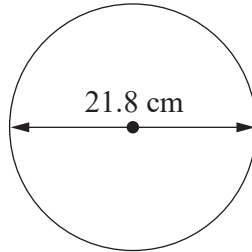
_____

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

_____

QUESTION 4 (6 marks)

A medicine ball with an internal diameter as shown, is filled with water.

Not to scale

21.8 cm

a) What is the diameter of the medicine ball in centimetres when rounded using
    leading-digit approximation?   *[1 mark]*

_____

b) Use your result from Question 4a) to determine the approximate radius of the
    medicine ball in centimetres.   *[1 mark]*

_____

c) Use your result from Question 4b) to calculate the approximate volume of the
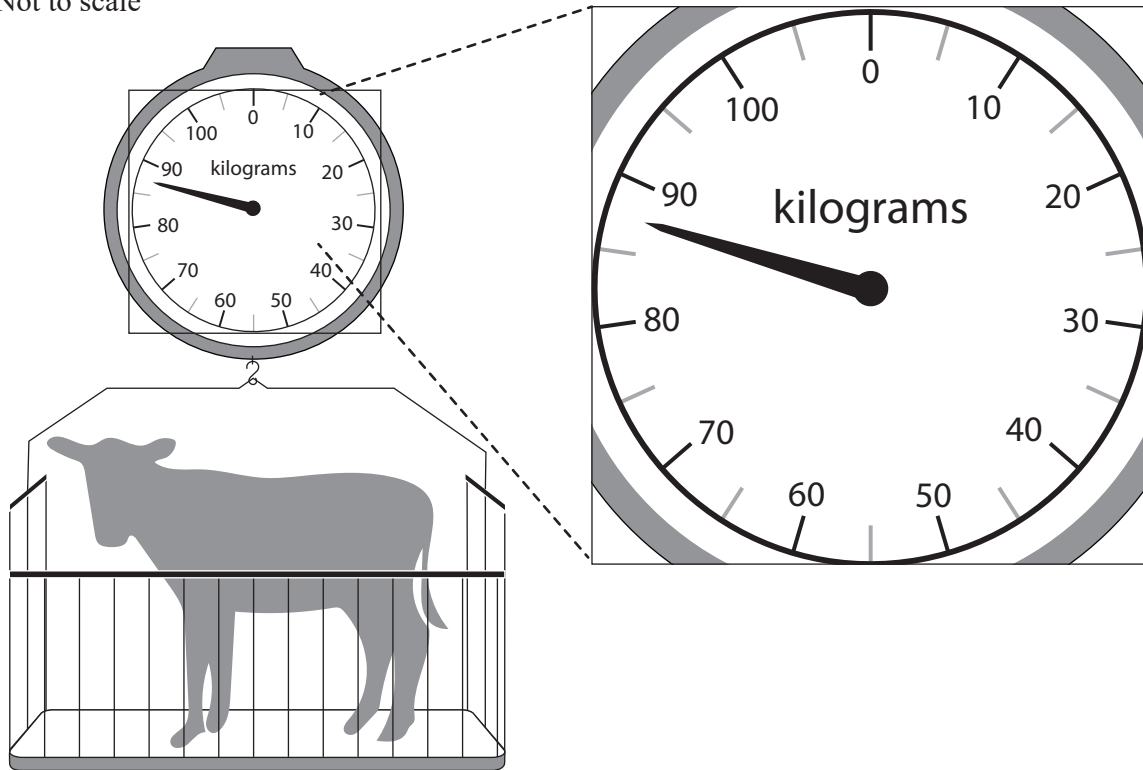   medicine ball in cubic centimetres.   *[2 marks]*

_____

_____

_____

d) Use your result from Question 4c) to estimate the amount of water required to fill
    three medicine balls in millilitres.   *[2 marks]*

_____

_____

_____

QUESTION 5 (4 marks)

The mass of a calf is shown on the scales.

Not to scale

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

_____

A livestock trailer can carry a maximum mass of 1 tonne.

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

_____

c) Assuming all calves have the same mass, calculate the maximum number of calves
the livestock trailer can carry.   *[2 marks]*

_____

_____

_____

QUESTION 6 (5 marks)

The data shows the prices of the last nine houses sold in Gympie, in thousands of dollars.

House prices ($'000s)	540	480	460	500	520	500	490	480	520

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

Minimum	Lower quartile			Maximum
	480		520	

b) Use your results from Question 6a) to construct a box plot to represent the data, using
   the response space provided.   *[2 marks]*

430 440 450 460 470 480 490 500 510 520 530 540 550 560 570
House prices ($'000s)

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.

QUESTION 7 (5 marks)

The number of runs scored by a cricketer in 12 matches is shown.

Stem	Leaf
1	1 2 4 5 9
2	1 2 3 3 3
3	0
8	8

Key: 1 | 1 = 11 runs

a) Identify the modal number of runs.   *[1 mark]*

_____

b) Calculate the mean number of runs.   *[2 marks]*
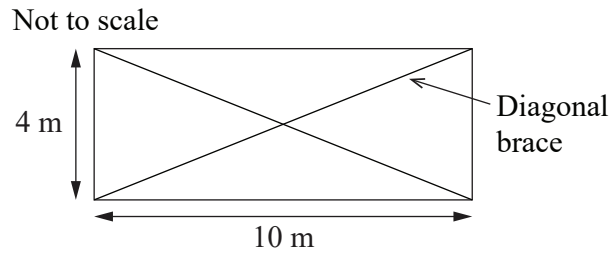
_____

_____

_____

_____

c) Determine the median number of runs.   *[1 mark]*

_____

_____

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

_____

_____

QUESTION 8 (5 marks)

A company makes billboards with diagonal braces, as shown.

Not to scale

4 m

10 m

Diagonal
brace

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

_____

_____

_____

_____

_____

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

_____

_____

_____

_____

_____

_____

QUESTION 9 (6 marks)

The scale drawing of a glass panel in the shape of a parallelogram is shown.
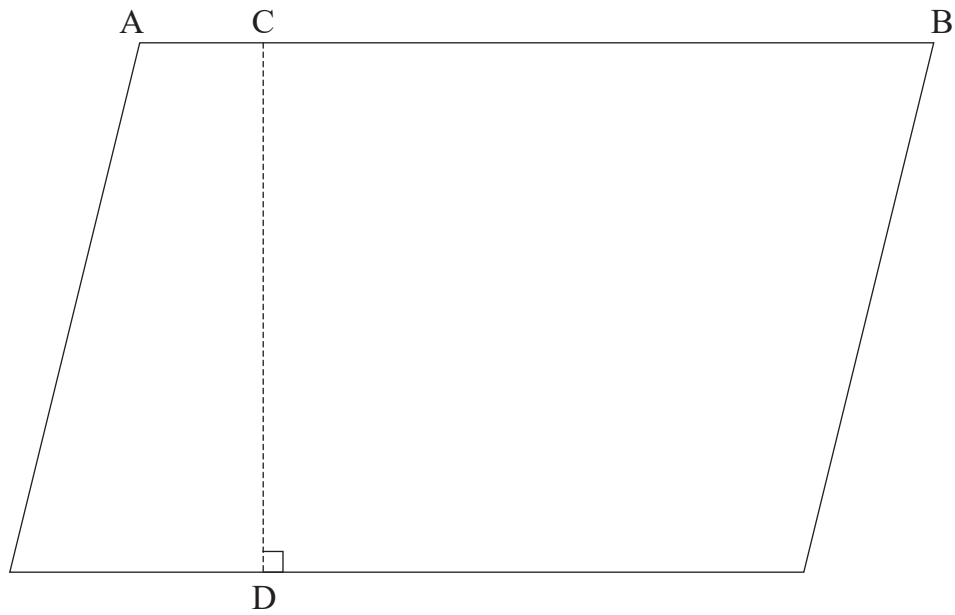
Scale 1:9

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

_____

_____

_____

_____

b)   Calculate the actual perpendicular height of the parallelogram (length CD) in centimetres.   *[2 marks]*

_____

_____

_____

_____

c) Use your results from Questions 9a) and 9b) to calculate the actual area of the glass panel, rounded to the nearest square centimetre. *[2 marks]*
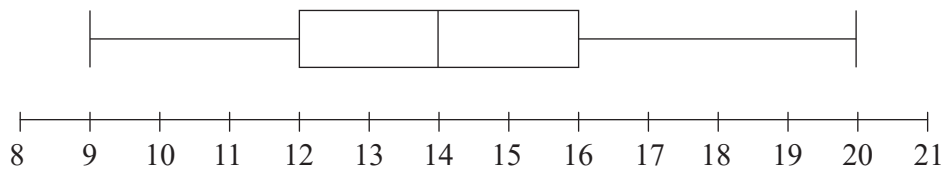
Part B: Complex

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

QUESTION 10 (5 marks)

A fruit shop owner is choosing between two packing machines to pack mangoes in trays. They test each packing machine's ability to consistently pack 14 mangoes per tray.

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

Packing machine A

The test data for packing machine B is 8, 11, 11, 14, 14, 14, 18, 18, 21.
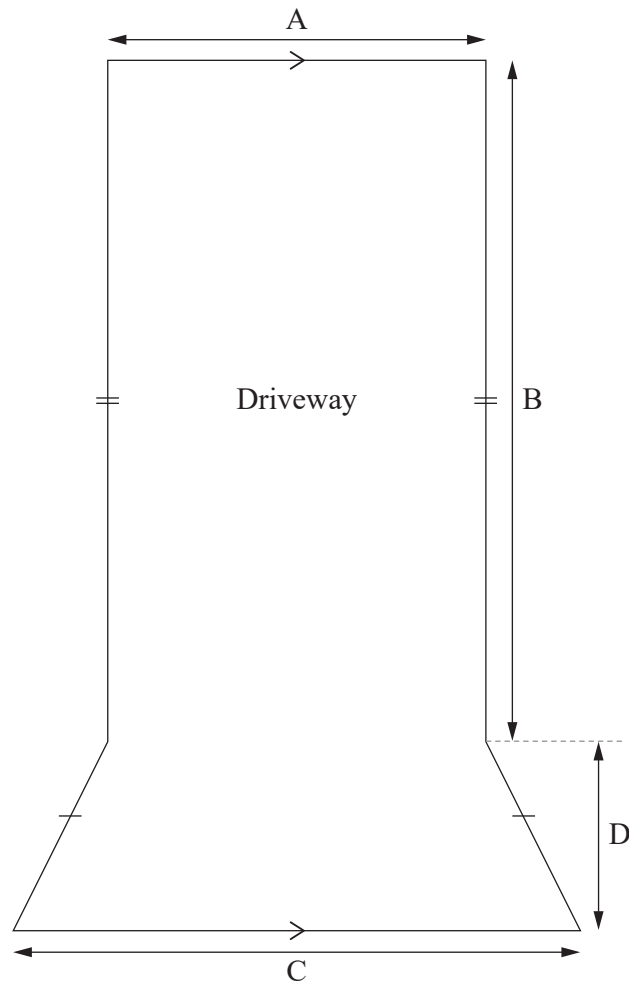
Based on the interquartile range, determine the most consistent packing machine.

QUESTION 11 (5 marks)

Bella is laying concrete for her driveway. A scale drawing of the driveway is shown.

Bella believes that 40 bags of concrete will be enough concrete for the driveway. If one bag of concrete covers 0.9 m^2, evaluate the reasonableness of Bella's belief.

Scale 1:80

END OF PAPER

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.

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

430 440 450 460 470 480 490 500 510 520 530 540 550 560 570

House prices ($'000s)

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