Given name/s

Family name

Teacher

Class

School name

Common internal assessment 2025 — 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

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.

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### QUESTION 1 (2 marks)

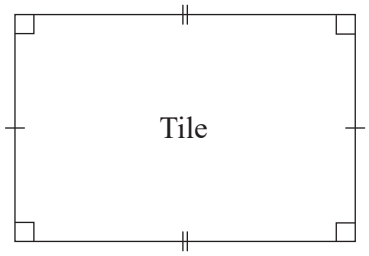
Dishwashing liquid is sold in 850 mL bottles. An average portion of dishwashing liquid is 37 mL.

How many average portions of dishwashing liquid are in one bottle, to the nearest whole number?

Do not write outside this box.

## QUESTION 2 (4 marks)

A tiler is hired to install tiles of the shape below.




Scale 1:15

a) Determine the actual length of the tile in centimetres. *[1 mark]*

b) Determine the actual width of the tile in centimetres. *[1 mark]*

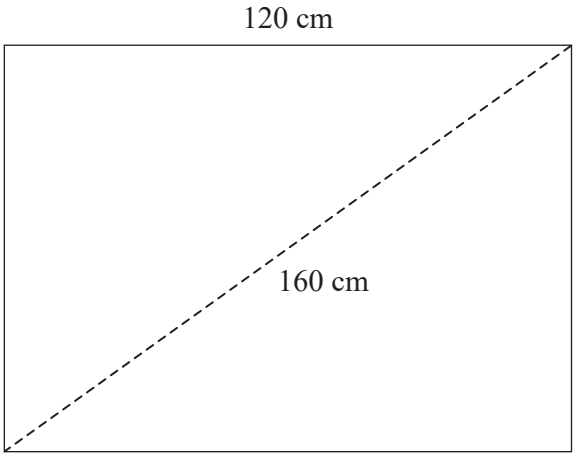
c) Determine the actual area of the tile in square centimetres. *[2 marks]*

Do not write outside this box.

## QUESTION 3 (6 marks)

A landscaper is constructing a rectangular retaining wall with a diagonal brace, as shown.

Not to scale




a) Use Pythagoras' theorem to calculate the height of the wall, rounded to the nearest centimetre. *[3 marks]*

b) Calculate the perimeter of the rectangular wall in metres. *[3 marks]*

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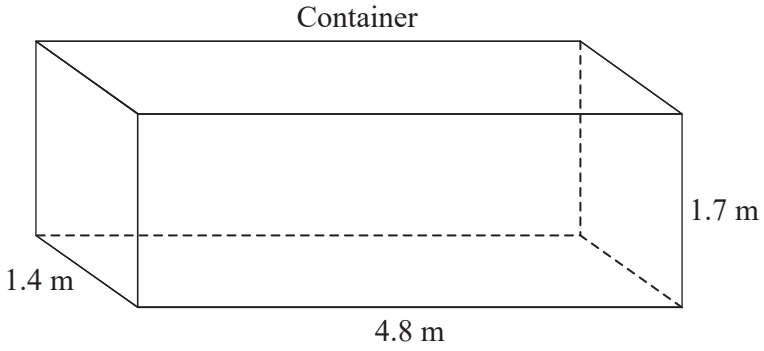
## QUESTION 4 (5 marks)

Sand is loaded into a container in the shape of a rectangular-based prism, with the internal dimensions shown.

Not to scale




a) Use leading-digit approximation to estimate the volume of the container in cubic metres. *[2 marks]*

The sand weighs approximately 2000 kilograms per cubic metre ($kg/m^3$).

b) Determine the approximate mass of sand in a full container in kilograms. *[1 mark]*

Do not write outside this box.

c) Convert the approximate mass of sand in a full container from kilograms to tonnes. *[1 mark]*

The cost for container delivery is $275 per tonne.

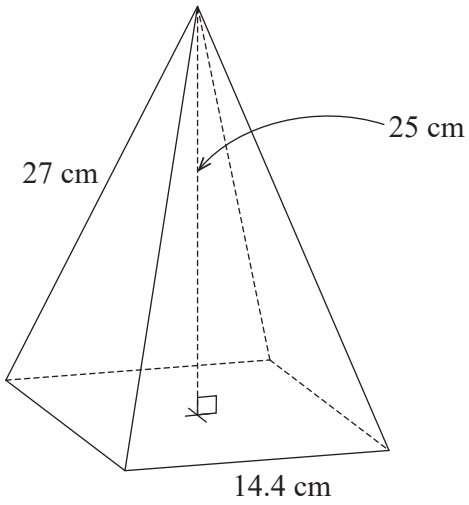
d) Determine the approximate total cost to deliver a full container. *[1 mark]*

Do not write outside this box.

## QUESTION 5 (6 marks)

An artist makes a lantern in the shape of a square-based pyramid, as shown.

Not to scale




a) How many faces does the lantern have? *[1 mark]*

The frame of the lantern is made from copper wire.

b) Calculate the total length of copper wire used to construct the frame of the lantern in centimetres. *[2 marks]*

c) Calculate the volume of the lantern in cubic centimetres. *[2 marks]*

Do not write outside this box.

The box used to pack the lantern has a volume of 6912 $cm^3$.

d) Determine what fraction of the box's volume is occupied by the lantern. *[1 mark]*

Do not write outside this box.

## QUESTION 6 (6 marks)

A shopkeeper records the time (minutes) that customers spend in their store one day, as shown.

| **Customer** | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time** | 6 | 11 | 12 | 5 | 6 | 6 | 12 | 10 | 15 | 15 | 3 | 12 | 7 |

a) Calculate the mean time a customer spends in the store. *[2 marks]*

b) Determine the median time a customer spends in the store. *[2 marks]*

c) Complete the five-number summary table for the time any given customer spends in the store by writing an appropriate label or value in each empty cell of the table. *[2 marks]*

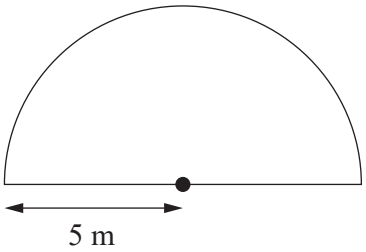
| | $Q_1$ | | $Q_3$ | Maximum |
|---|---|---|---|---|
| | 6 | | 12 | |

Do not write outside this box.

## QUESTION 7 (3 marks)

A fenced enclosure is in the shape of a semicircle, as shown.

Not to scale




a) Calculate the arc length of the fenced enclosure in metres, rounded to two decimal places. *[2 marks]*

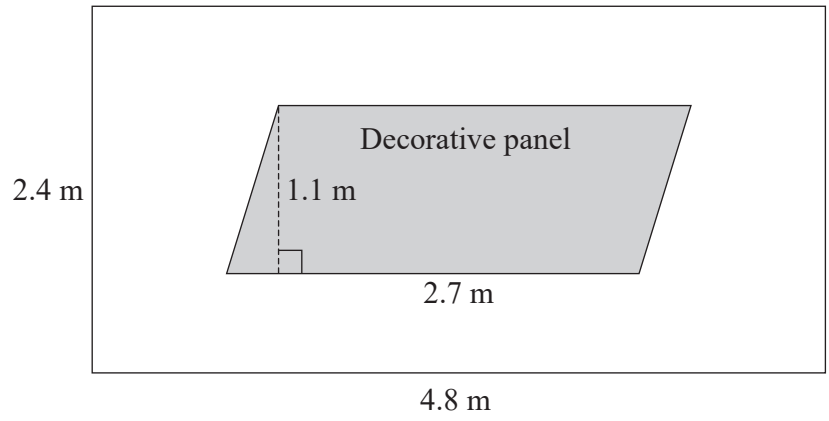
b) Determine the perimeter of the fenced enclosure in metres. *[1 mark]*

Do not write outside this box.

## QUESTION 8 (5 marks)

A homeowner is designing a rectangular garage door that features a decorative panel in the shape of a parallelogram, as shown.

Not to scale




a) Calculate the area of the entire garage door in square metres. *[2 marks]*

b) Calculate the area of the decorative panel in square metres. *[2 marks]*

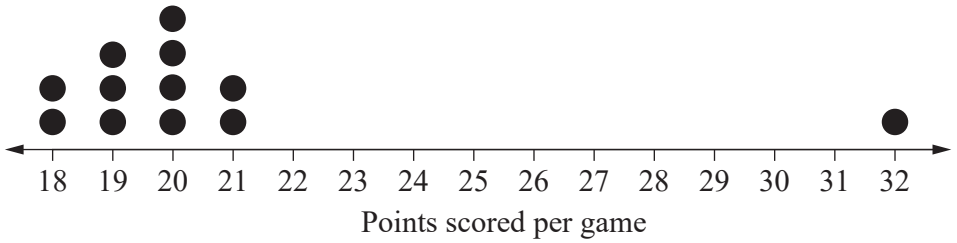
Do not write outside this box.

The homeowner claims that the decorative panel covers more than one quarter of the garage door area.

c) Explain why the homeowner's claim is reasonable. Your response must include mathematical reasoning. *[1 mark]*

## QUESTION 9 (3 marks)

The number of points a basketball player scored per game in the past 12 games is shown.




a) Identify the mode number of points scored per game. *[1 mark]*

b) Describe two different features of the spread of this data. *[2 marks]*

Do not write outside this box.

## Part B: Complex

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

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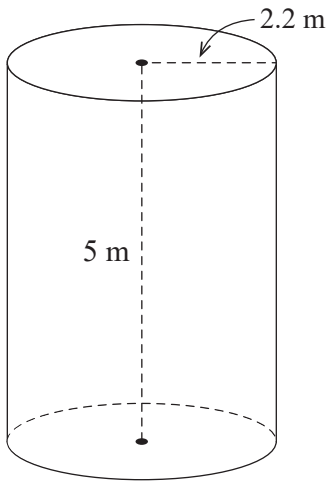
### QUESTION 10 (5 marks)

A family has a fully enclosed water tank and wants to paint the entire exterior, except for the base, as shown.

Not to scale




Water tank

One litre of paint costs \$22.90 and covers 5 $m^2$. The family has \$350 to buy the paint.

Determine if the family can buy enough paint.

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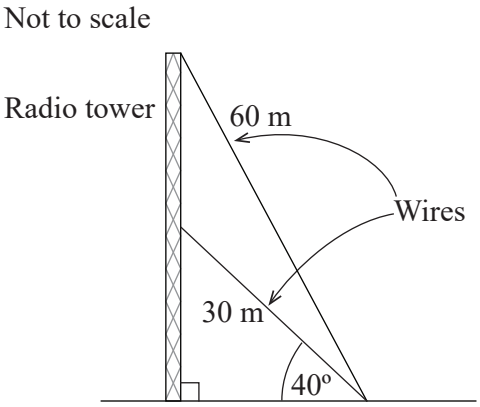
Do not write outside this box.

## QUESTION 11 (5 marks)

A radio tower is supported by two wires, as shown.




A safety requirement is that the lower wire must be connected at least halfway up the radio tower.

Determine if the lower wire is in an appropriate position. Provide mathematical reasoning in your justification.

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**END OF PAPER**

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## ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

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