Given name/s			
Family name			
Teacher		Class	
School name			

Common internal assessment 2022 — Phase 1

Question and response book

Essential Mathematics

Time allowed

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

General instructions

- Answer all questions in the question and response book.
- Type responses in text fields.
- 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

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Queensland Government | QCAA Queensland Curriculum & Assessment Authority

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Instructions

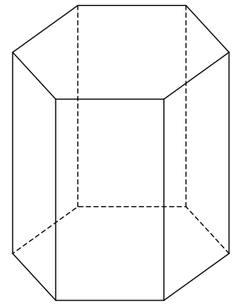
- Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
- If you need more space for a response, use the additional pages at the back of this book.
  - On the additional pages, type the question number you are responding to.
  - Type the page 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.

QUESTION 1 (2 marks)

Jewellery is displayed in an enclosed cabinet in the shape of a hexagonal-based prism, as shown.



Not to scale

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

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

Do not write outside this box.

QUESTION 2 (5 marks)

Dancers invite family members to a performance. The number of family members invited by 11 dancers is shown in the table.

Number of family members	4	1	5	2	3	2	4	2	3	5	2

a) List the values from smallest to largest. *[1 mark]*

b) Determine the median number of family members. *[1 mark]*

c) State the modal number of family members. *[1 mark]*

d) Calculate the mean number of family members. *[2 marks]*

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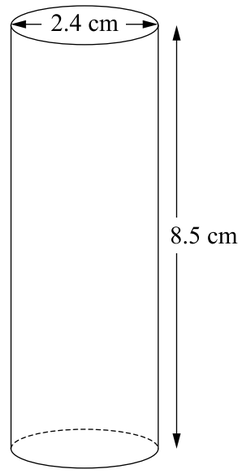
QUESTION 3 (6 marks)

A scientist is filling cylindrical containers with creek water to test its quality. The diagram shows the dimensions of each container.



Not to scale

a) Determine the radius of the container in centimetres (cm). *[1 mark]*

b) Use the result from Question 3a) to calculate the volume of the container, rounded to the nearest cubic centimetre (cm^3). *[3 marks]*

c) Use the result from Question 3b) to determine the number of millilitres (mL) of creek water in 12 full containers. *[2 marks]*

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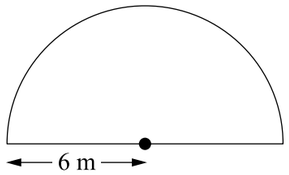
QUESTION 4 (4 marks)

A fenced enclosure is in the shape of a semicircle with a radius of 6 metres (m), as shown.



Not to scale

a) Calculate the arc length of the fenced enclosure in metres (m). *[2 marks]*

b) Use the result from Question 4a) to calculate the perimeter of the fenced enclosure in metres (m). *[2 marks]*

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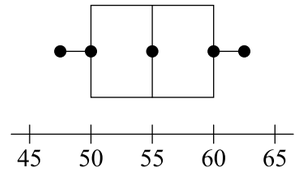
QUESTION 5 (5 marks)

A council planted trees along Main Street several years ago. The box plot shows the distribution of tree heights, in centimetres (cm), at the time of planting.



Tree height (cm)

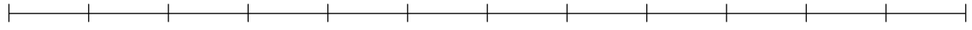
a) State the median tree height, in centimetres (cm), at the time of planting. *[1 mark]*

b) Describe the spread of the box plot for the tree heights at the time of planting. *[1 mark]*

All trees have grown in height since being planted. The five-number summary for the current tree heights, in metres (m), is 1.6, 1.8, 2.0, 2.2, 3.0.

c) Use the five-number summary to construct a box plot for the current tree heights. *[2 marks]*

Draw your box plot here.



Complete annotations or drawings in the printed question and response book.

d) Describe the spread of the box plot for the current tree heights. *[1 mark]*

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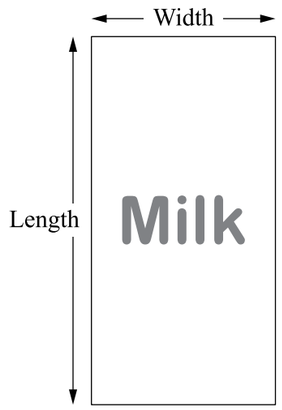
QUESTION 6 (5 marks)

The scale diagram shows the rectangular label on a carton of milk.



Scale 1:3

a) Determine the actual width and length of the label in centimetres (cm). *[3 marks]*

b) Calculate the actual area of the label in square centimetres (cm^2). *[1 mark]*

The mass of the carton of milk is 1.2 kilograms (kg).

c) What is the mass of the carton of milk in grams (g)? *[1 mark]*

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QUESTION 7 (3 marks)

Birrani is laying tubing for a garden watering system. He uses his foot length to estimate the length of three pieces of tubing. Birrani's foot length is approximately 30 centimetres (cm).

Piece of tubing	Number of foot lengths
1	8
2	6
3	6

a) Determine the estimated length of piece 1 in centimetres (cm). *[1 mark]*

b) Determine the estimated length of piece 2 in centimetres (cm). *[1 mark]*

c) Determine the estimated total length for all three pieces of tubing in centimetres (cm). *[1 mark]*

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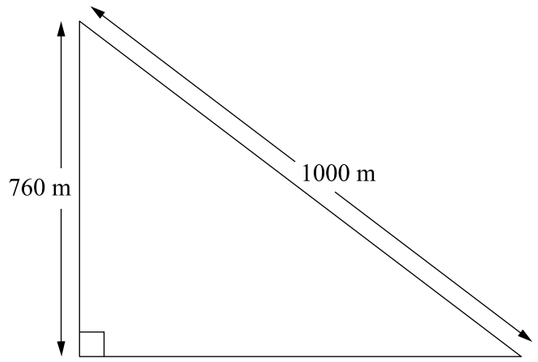
QUESTION 8 (7 marks)

A running track in the shape of a right-angled triangle will be used for a charity event.



Not to scale

a) Use Pythagoras' theorem to calculate the third length of the running track in metres (m). *[2 marks]*

The area enclosed by the running track will be the viewing area for spectators.

b) Use the result from Question 8a) to calculate the viewing area in hectares (ha). *[3 marks]*

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It is predicted that 45 000 spectators will attend the event. No more than 2000 spectators per hectare will be allowed in the viewing area.

c) Use the result from Question 8b) to explain whether 45 000 spectators will be allowed in the viewing area. *[2 marks]*

QUESTION 9 (3 marks)

Students were surveyed about the distance they travelled to school in kilometres (km). The results for 18 students are shown in the stem-and-leaf plot.

Stem	Leaf
0	1 1 2 3 3 4 5 5 7 9
1	2 2 4 4 6 8
2	0 3

Key: 1\|2 = 12 km

Complete the five-number summary for distance travelled by writing an appropriate label or value in each empty cell of the table.

	Lower quartile(Q_1)		Upper quartile (Q_3)	
	3		14	

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Part B: Complex

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

QUESTION 10 (5 marks)

A wall frame in the shape of a trapezium is represented in the scale diagram. The wall frame's actual measurements are shown in metres (m).

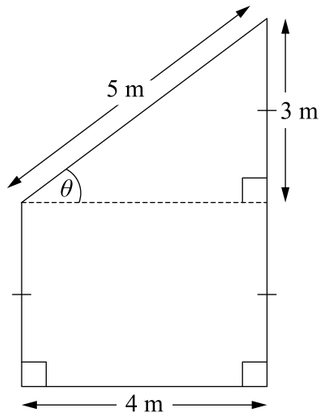

Diagram to scale

a) Measure the scale diagram to determine the scale used to represent the wall frame. Write the scale in simplest form. *[2 marks]*

b) Calculate the perimeter of the wall frame in metres (m). *[1 mark]*

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c) Use trigonometry to calculate angle θ in degrees. *[2 marks]*

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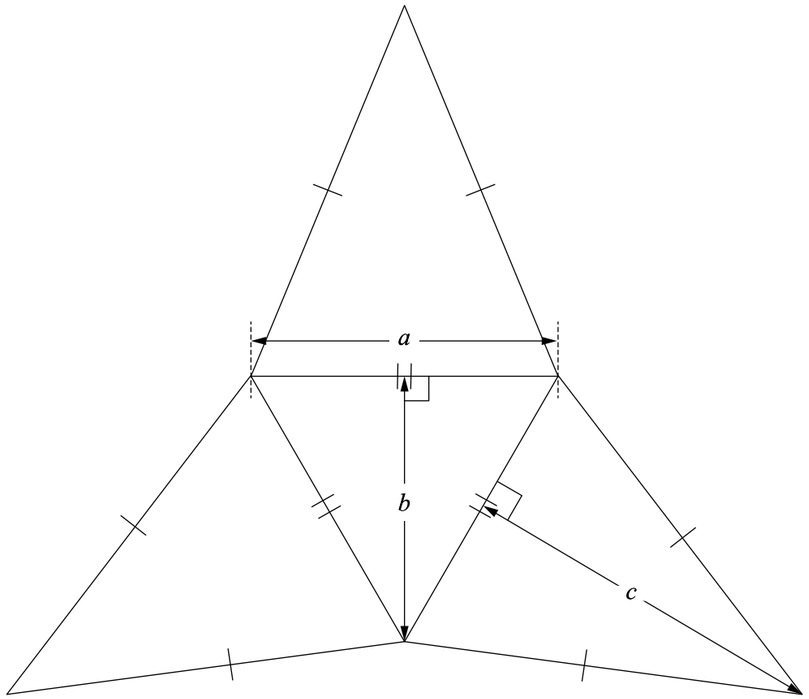
QUESTION 11 (5 marks)

A customer buys cardboard templates that can be folded to make gift boxes in the shape of a triangular-based pyramid. The scale drawing shows the net for one cardboard template. The table shows the scale drawing measurements in centimetres (cm).



Scale 1:2

Dimension	Scale drawing measurement (cm)
a	5
b	4.3
c	6

Each cardboard template costs 2 cents per square centimetre (cents/cm^2). The customer assumes they can purchase 8 templates for under $40. Evaluate the reasonableness of this assumption.

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Type the question number you are responding to.

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Type the question number you are responding to.

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