Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Queensland Curriculum and Assessment Authority

Essential Mathematics 2025 v1.2

IA4: Sample assessment instrument

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Student name	sample only
Student number	sample only
Teacher	sample only
Exam date	sample only

Marking summary

Criterion	
Foundational knowledge and problem solving	
Overall	

Conditions

Technique	Examination – short response
Unit	Unit 4: Graphs, data and loans
Topic/s	Unit 4 — Fundamental topic: Calculations Unit 4 — Topic 1: Bivariate graphs Unit 4 — Topic 2: Summarising and comparing data Unit 4 — Topic 3: Loans and compound interest
Time	1 hour + 5 minutes perusal
Seen / Unseen	Unseen questions
Other	Only the QCAA formula book must be provided. Notes are not permitted.

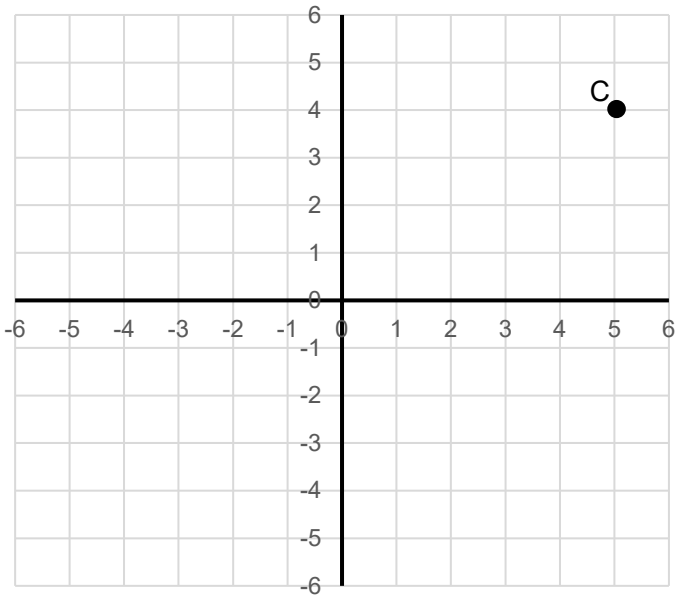
Instructions

- Write your answers in the response booklet using black or blue pen.

Summative internal assessment 4: Examination

Question 1 (3 marks)

The Cartesian plane below shows Colin's position (C) on a sports field.



a. Write down the coordinates of Colin's position. *[1 mark]*

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b. Adam is at position A (2, –4) and Ben is at position B (–3, 0) on the sports field.
Plot the positions of these players on the Cartesian plane. *[2 marks]*

Question 2 (3 marks)

The cost of a taxi ride can be represented by the equation: $C = 4 + 2D$, where C is the total fare (in dollars) and D is the total distance travelled (in kilometres).

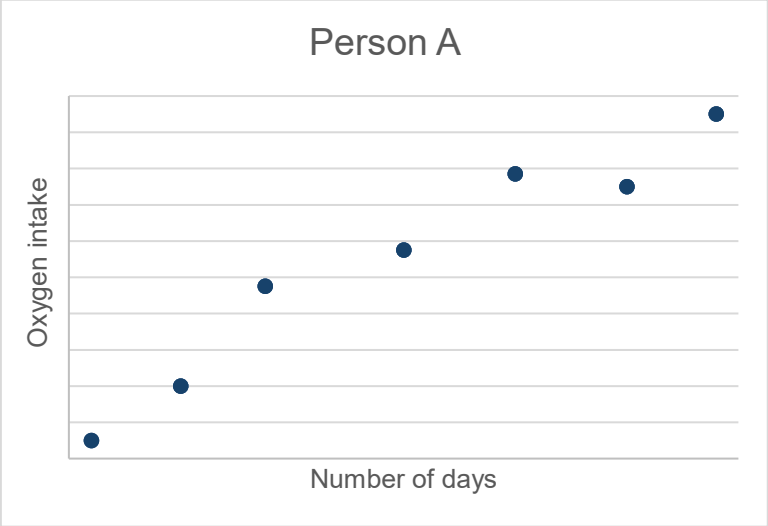
The table below shows the fare for different distances travelled. Use the equation above to calculate the missing total fares and write them in the blank spaces.

total distance, D (km)	**0**	**1**	**2**	**5**	**10**
total fare, C ($)		6	8		

Question 3 (3 marks)

Oxygen intake is a measure of cardiovascular fitness.

The graphs below represent the cardiovascular fitness of Person A over a few days of training.



Describe the association between oxygen intake and the number of days in terms of direction, form and strength for Person A.

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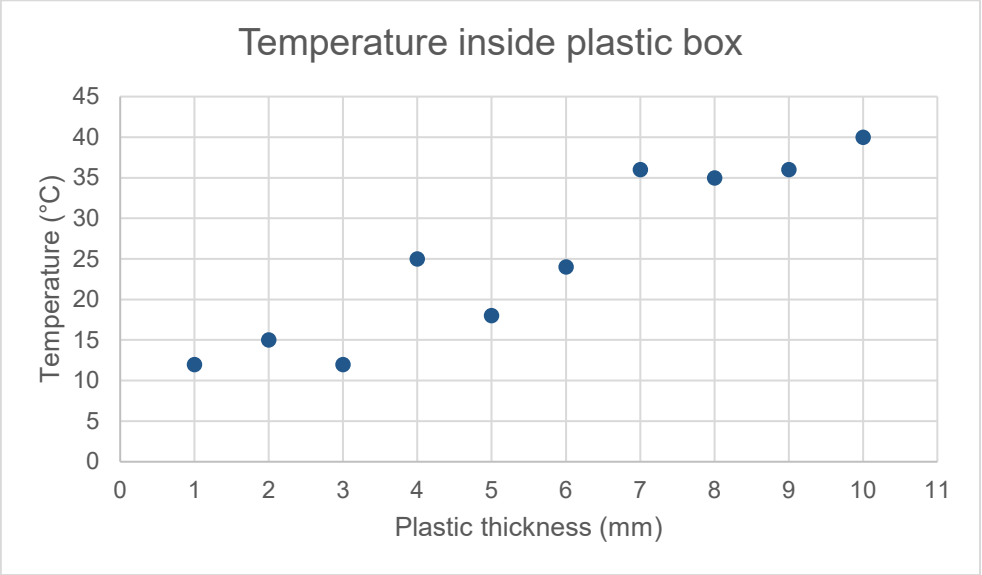
Question 4 (4 marks)

Consider the scatterplot below.



a. Identify the dependent and independent variables. *[2 marks]*

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b. Draw a line of best fit on the scatterplot. *[1 mark]*

c. Describe one feature of the scatterplot. *[1 mark]*

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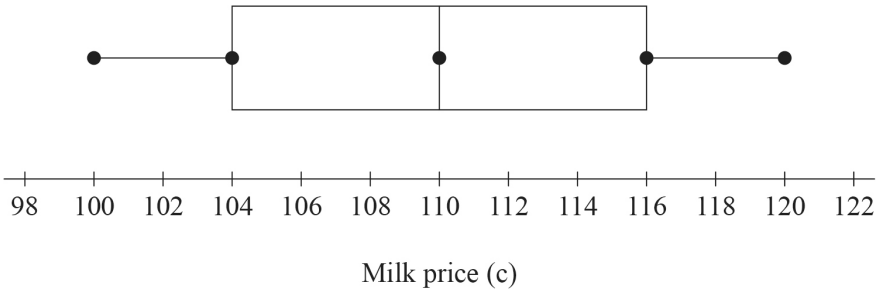
Question 5 (4 marks)

The box plot shows the distribution of the price, in cents (c), for a litre of milk over the past 10 years.



a) Describe the spread of the box plot for the milk price. *[1 mark]*

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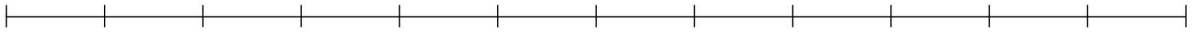
The five-number summary for the price in cents (c) of a litre of petrol over the past 10 years is: 118, 132, 142, 145, 150.

b) Use the five-number summary to construct a box plot for the petrol price. *[2 marks]*

Draw your box plot here.



c) Describe the spread of the box plot for the petrol price. *[1 mark]*

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Question 6 (7 marks)

The number of children from 12 families at a beach is shown in the table.

Number of children	**3**	**1**	**2**	**1**	**3**	**4**	**2**	**1**	**1**	**1**	**1**	**4**

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

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b. Determine the median number of children. *[1 mark]*

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c. State the modal number of children. *[1 mark]*

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d. Calculate the mean number of children. *[2 marks]*

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e. Determine the first quartile (Q_1) value. *[1 mark]*

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f. Determine the third quartile (Q_3) value. *[1 mark]*

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Question 7 (4 marks)

Carrie deposits $500 into her bank account. The account offers an interest rate of 7.5% p.a. simple interest. Carrie has five years to save for a formal dress.

a. Calculate the total interest she would earn over five years. *[2 marks]*

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b. If Carrie used all her savings, determine the most expensive dress she could afford after five years. *[2 marks]*

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Question 8 (4 marks)

Lilly is going to purchase a car for $15 000 from a used-car dealership.

The used-car dealership offers 9.5% compound interest loans with annual rests over 6 years.

a. Calculate the future value of the compound interest loan. Round your answer to the nearest dollar. *[2 marks]*

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b. Calculate the total interest paid for the compound interest loan. *[2 marks]*

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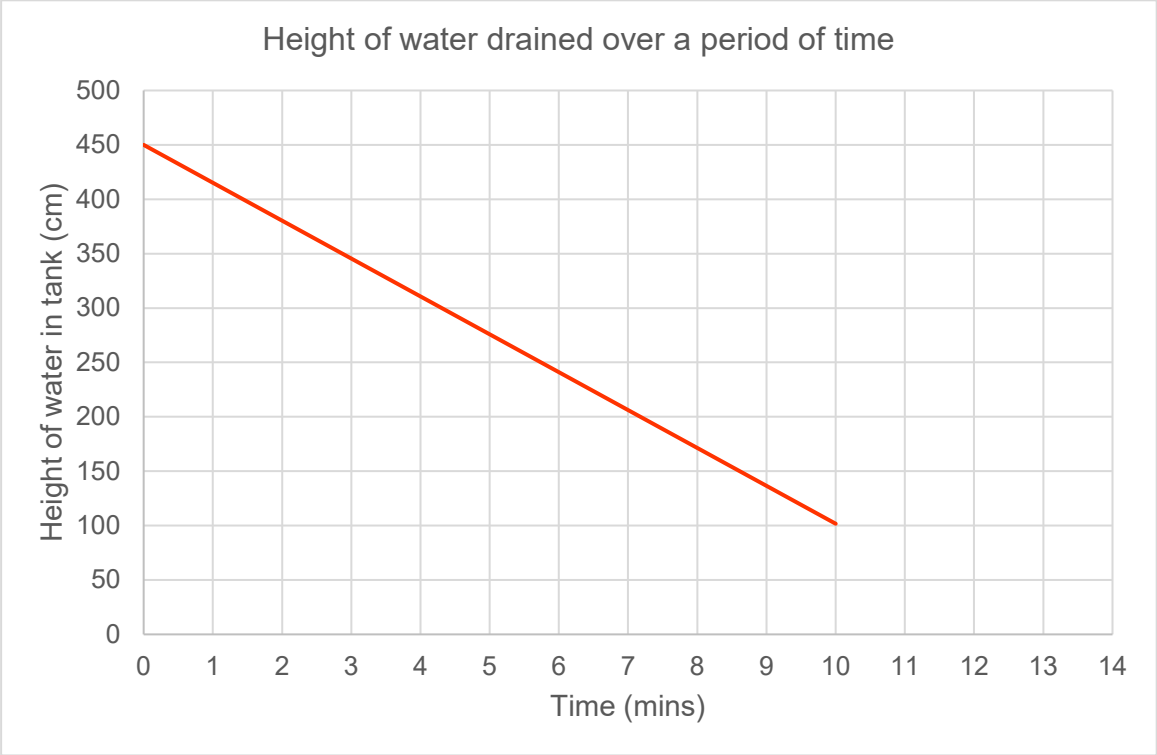
Question 9 (4 marks)

The graph below shows the rate at which water drains out of a rainwater tank.



a. Determine the height of water in the tank after draining for three minutes.

[1 mark]

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b. Determine how long it would take for water in the tank to drain to a height of 225 cm.

[1 mark]

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c. Evaluate the reasonableness of the prediction that the tank will be empty after draining for approximately 13 minutes. Provide mathematical reasoning.

[2 marks]

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Question 10 (4 marks)

Two teams of 12 cyclists complete a time trial. The time, in minutes (min), for each cyclist is shown in the table.

Time for Team 1 (min)	25	26	28	30	32	33	34	34	35	37	38	40
Time for Team 2 (min)	26	28	29	31	33	34	35	38	40	42	44	45

The coach analysed the data and concluded that Team 1 was faster.

Evaluate the reasonableness of the coach's conclusion.

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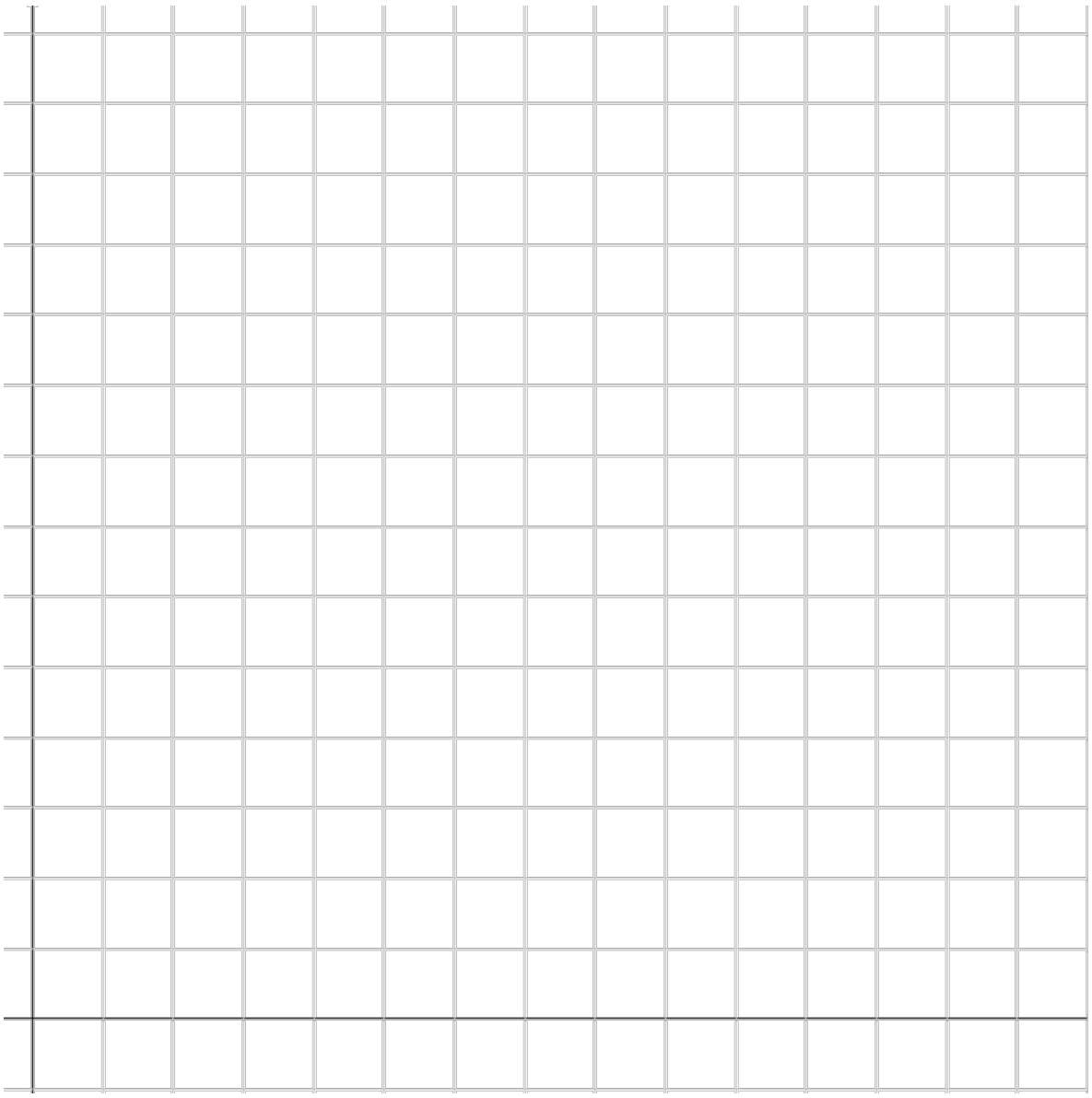

Instrument-specific standards: (IA4): Examination

Foundational knowledge and problem-solving	Cut-off	Grade
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.	> 80%	**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.	> 60%	**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.	> 40%	**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.	> 20%	**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**