Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Queensland Curriculum and Assessment Authority

General Mathematics 2025 v1.2

IA2: 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	Marks allocated	Provisional marks
Foundational knowledge and problem-solving	15	
Overall	**15**	

Conditions

Technique	Examination
Unit	Unit 3: Bivariate data and time series analysis, sequences and Earth geometry
Topic/s	Topic 1: Bivariate data analysis 1 Topic 3: Time series analysis Topic 4: Growth and decay in sequences
Time	90 minutes + 5 minutes perusal
Seen / Unseen	Unseen questions
Other	The teacher must provide the QCAA General Mathematics formula book. Students are required to use technology. Students must not bring notes into the examination.

Instructions

- Show all working in the space provided.
- Use a blue or black pen.

Question 1 (3 marks)

Simple familiar

A market researcher interviewed 60 people about their preferred telecommunications provider. Of the 35 adults interviewed, 12 preferred Provider X, while 13 of the teenagers preferred Provider Y. Ten people preferred an alternative company, with four of those people being adults.

Complete all entries for the two-way frequency table below.

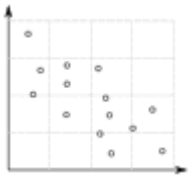
		Person		
		Adult	**Teenager**	**Total**
Provider	**Provider X**			
	Provider Y			
	Alternative			
	Total			

Question 2 (3 marks)

Simple familiar

For each scatterplot, describe the association in terms of direction and strength, and provide a possible value for Pearson's correlation coefficient.

a.



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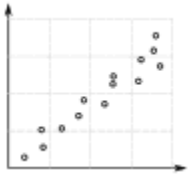
b.



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Question 3 (4.5 marks)

Simple familiar

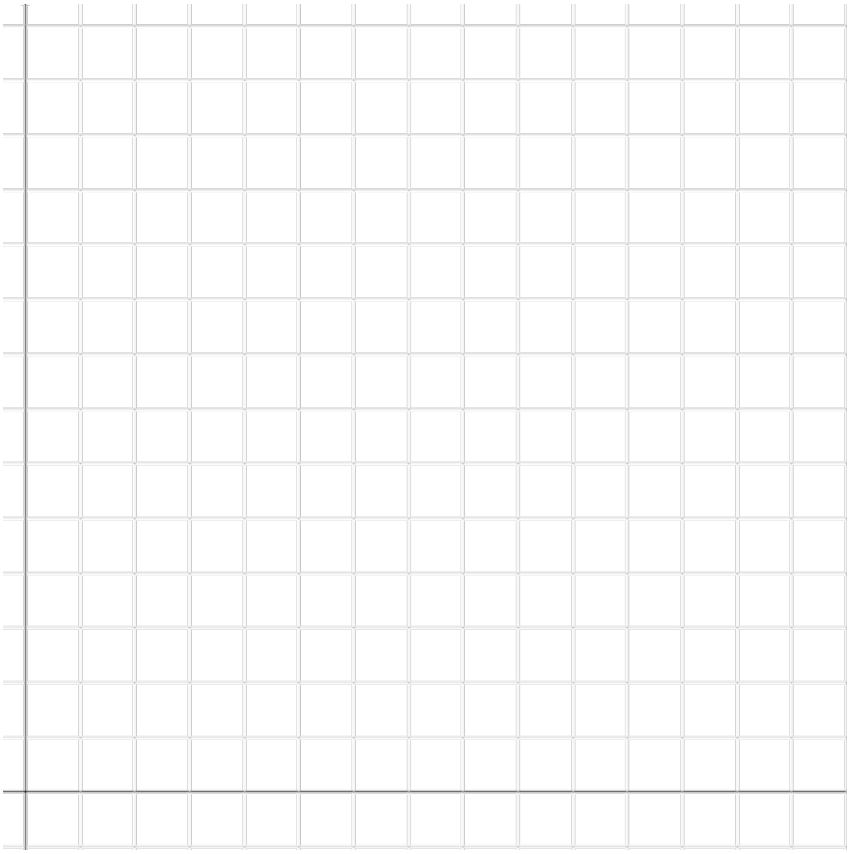
The table shows data for the number of twin births in Queensland over 11 years.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of twin births	828	802	893	943	1020	1014	988	977	1000	925	940

From: Australian Bureau of Statistics. *Births, Australia, 2014*. www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3301.02014?OpenDocument.

a. Construct a time series plot of the data.

b. Describe the trend of the time series.



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Question 4 (4 marks)

Simple familiar

The table shows the cost of a taxi ride.

Total distance, n (km)	1	2	3	4	5	6
Total fare, tn ($)	6	8.5	11	13.5	…	…

a. Demonstrate that the total fares form an arithmetic sequence.

b. Use the rule $t_n = 6 + 2.5(n - 1)$ to predict the total fare for a 35-kilometre taxi ride.

Question 5 (5 marks)

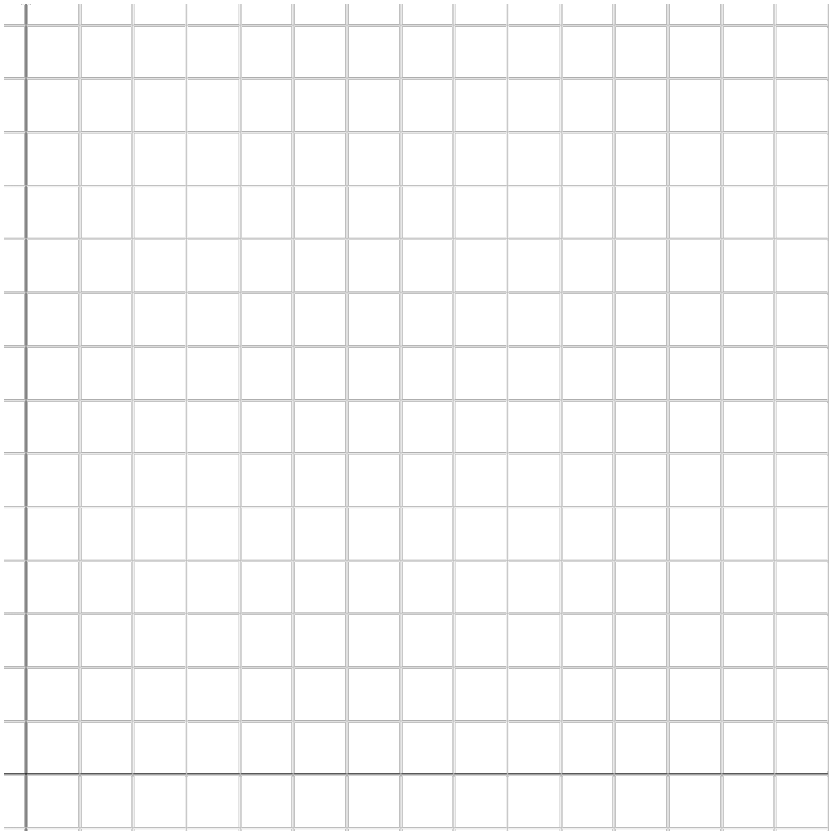
Simple familiar

The recursive formula $a_1 = 4$; $a_n = 3a_{n-1}$ models a bacterial population.

a. Generate the next two terms in the sequence.

b. Graphically display the first five terms of the sequence on the grid below.

c. State what type of model best describes the trend of the graph.



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Question 6 (6.5 marks)

Simple familiar

Average (mean) unleaded petrol retail prices in Queensland were recorded over 6 months.

Time (months)	1	2	3	4	5	6
Price (cents)	132.4	129.5	130.4	124.6	128.7	130.7

a. Calculate the 3-point moving averages.

b. Plot the moving averages on the graph below.

c. Comment on the trend of the time series data.

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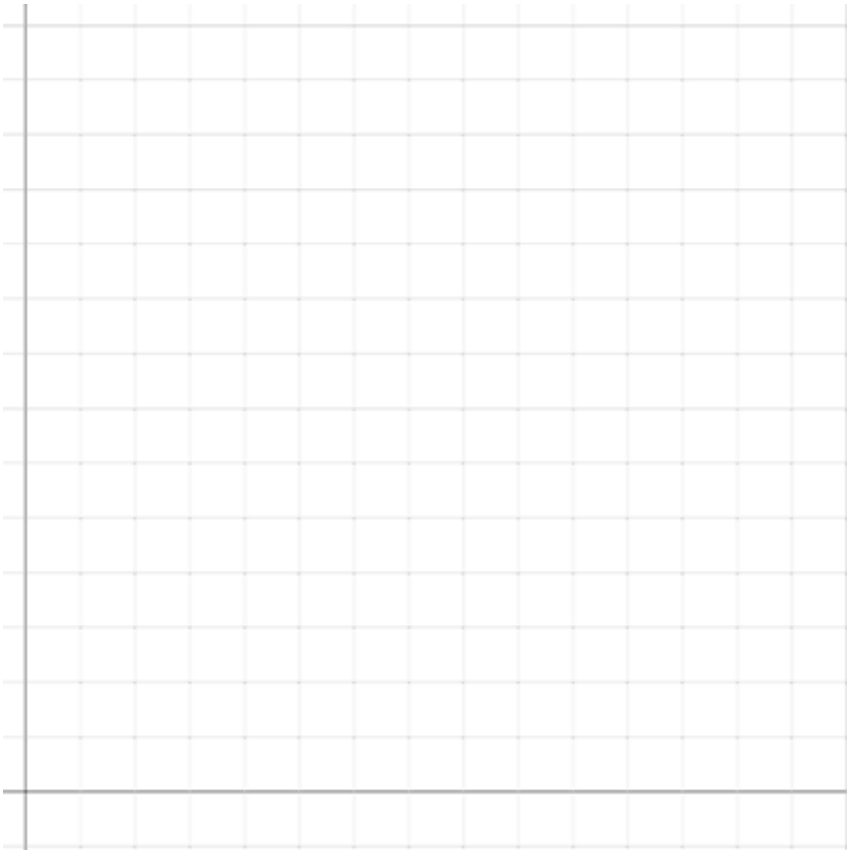

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Question 7 (8 marks)

Simple familiar, Complex familiar

Eighty-five students from the same school were surveyed about their preferred sport — volleyball or cricket. Some results are shown in the two-way frequency table.

		Preferred sport		
		Cricket	**Volleyball**	**Total**
School section	**Junior school**	24		
	Senior school		28	40
	Total		49	85

a. Calculate the percentage of students in the Junior school who prefer volleyball.

b. Of the students who prefer cricket, calculate the percentage who are in the Senior school.

c. Use percentages to explain whether there is an association between the variables.

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Question 8 (6 marks)

Complex familiar

A pump removes one-quarter of the contents of a 20,000-litre water tank every 15 minutes.

Determine how long the pump needs to run to reduce the contents of a full tank to 500 litres.

Question 9 (5 marks)

Complex unfamiliar

The table below shows the quarterly newspaper sales of a convenience store in 2024. The long-term seasonal indices for newspaper sales for the first three quarters are also shown.

Use a valid mathematical model to predict the actual newspaper sales for the fourth quarter of 2025.

	Newspaper sales			
	Quarter 1	**Quarter 2**	**Quarter 3**	**Quarter 4**
2024	2245	2038	3110	2907
Seasonal index	0.86	0.79	1.21	

Question 10 (5 marks)

Complex unfamiliar

When an empty garbage truck with a maximum carrying capacity of 1,500 kilograms, starts its daily round, it stops at a school, where it collects 186 kilograms of garbage. It then travels along a suburban street, where the amount of rubbish collected from each house is the same. After the 10th house, the truck is carrying 546 kilograms of garbage.

Will the truck be able to collect garbage at the 35th house?

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Examination marks summary

Question number	Simple familiar (SF)	Complex familiar (CF)	Complex unfamiliar (CU)
1	4		
2	3		
3	4.5		
4	4		
5	5		
6	6.5		
7	4	4	
8		6	
9			5
10			5
Totals	**30**	**10**	**10**

Instrument-specific marking guide (IA2): Examination (15%)

Foundational knowledge and problem-solving	Cut-off	Marks
The student response has the following characteristics:		
• consistently correct recall and use of mathematical knowledge; authoritative and accurate communication of mathematical knowledge; astute evaluation of the reasonableness of solutions; use of mathematical reasoning to correctly justify procedures and decisions; and fluent application of mathematical knowledge to solve problems in a comprehensive range of simple familiar, complex familiar and complex unfamiliar situations	>93%	15
	>87%	14
• correct recall and use of mathematical knowledge; clear communication of mathematical knowledge; considered evaluation of the reasonableness of solutions; use of mathematical reasoning to justify procedures and decisions; and proficient application of mathematical knowledge to solve problems in simple familiar, complex familiar and complex unfamiliar situations	>80%	13
	>73%	12
• thorough recall and use of mathematical knowledge; communication of mathematical knowledge; evaluation of the reasonableness of solutions; use of mathematical reasoning to justify procedures and decisions; and application of mathematical knowledge to solve problems in simple familiar and complex familiar situations	>67%	11
	>60%	10
• recall and use of mathematical knowledge; communication of mathematical knowledge; evaluation of the reasonableness of some solutions; some use of mathematical reasoning; and some application of mathematical knowledge to make progress towards solving problems in simple familiar situations	>53%	9
	>47%	8
• some recall and use of mathematical knowledge; and basic communication of mathematical knowledge	>40%	7
	>33%	6
• infrequent recall and use of mathematical knowledge; and basic communication of some mathematical knowledge	>27%	5
	>20%	4
• isolated recall and use of mathematical knowledge; and partial communication of rudimentary mathematical knowledge	>13%	3
	>7%	2
• isolated and inaccurate recall and use of mathematical knowledge; and disjointed and unclear communication of mathematical knowledge.	>0%	1
The student response does not satisfy any of the descriptors above.		0