LUI | | | | | | | | | | | School code | | | | |

School name

Given name/s

Family name

Attach your barcode ID label here

Book of books used

External assessment 2025

Question and response book

General Mathematics SEE

SEE 1

Time allowed

- Planning time — 15 minutes
- Working time — 180 minutes

General instructions

- Answer all questions in this question and response book.
- Write using black or blue pen.
- QCAA-approved scientific calculator permitted.
- QCAA formula book provided.
- Planning paper will not be marked.

Section 1 (52 marks)

- 6 short response questions

Clear zone — margin trimmed off after completion of assessment

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

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Section 1

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.

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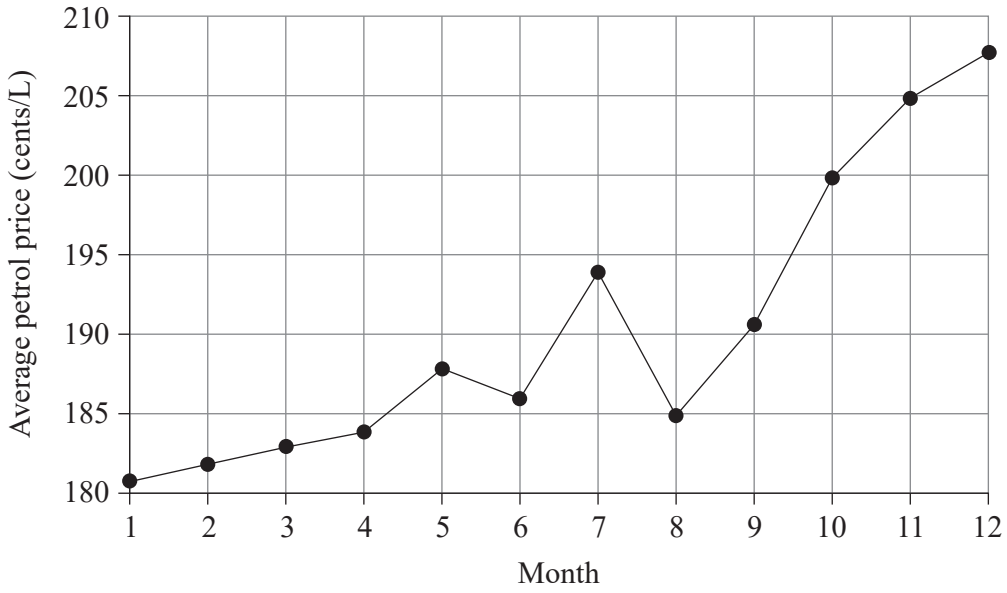
QUESTION 1 (7 marks)

The average petrol price (cents/L) in Gladstone in 2024 is shown in the time series plot.



a) Identify two features of the time series plot. *[2 marks]*

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b) Use the table to calculate the missing 3-point moving averages for the average petrol price (cents/L) in Gladstone in 2024. *[1 mark]*

Month	Months after Dec '23	Average price (cents/L)	3-point moving average
Dec 23	0	177	
Jan 24	1	181	
Feb 24	2	182	
Mar 24	3	183	
Apr 24	4	184	
May 24	5	188	
Jun 24	6	186	

Note: If you make a mistake, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this book.

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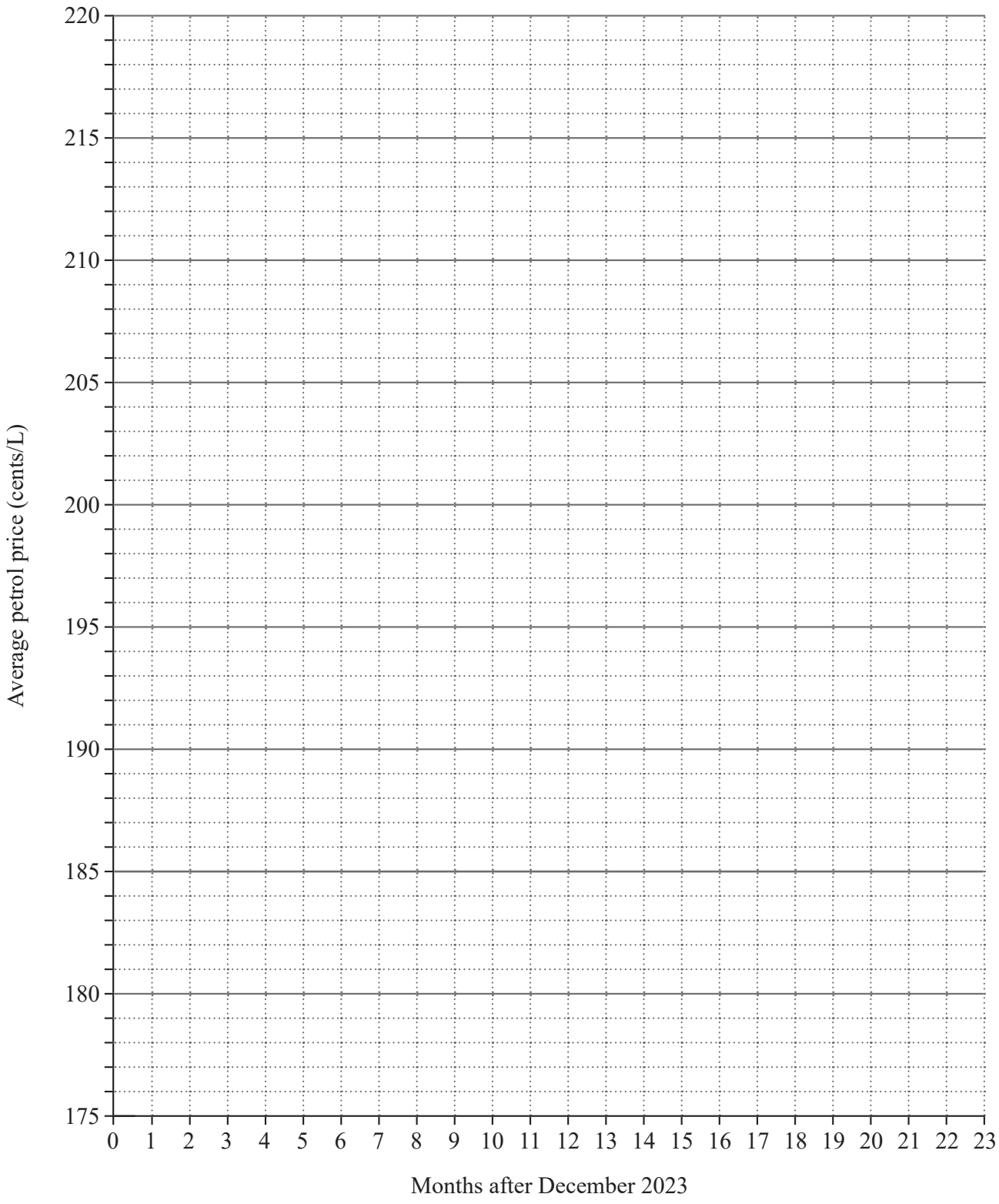
c) Use your results from Question 1b) to plot the 3-point moving averages on the graph. Draw a straight line through the points when $x = 1$ and $x = 5$, and then extend the line to $x = 23$ (November 2025). *[3 marks]*



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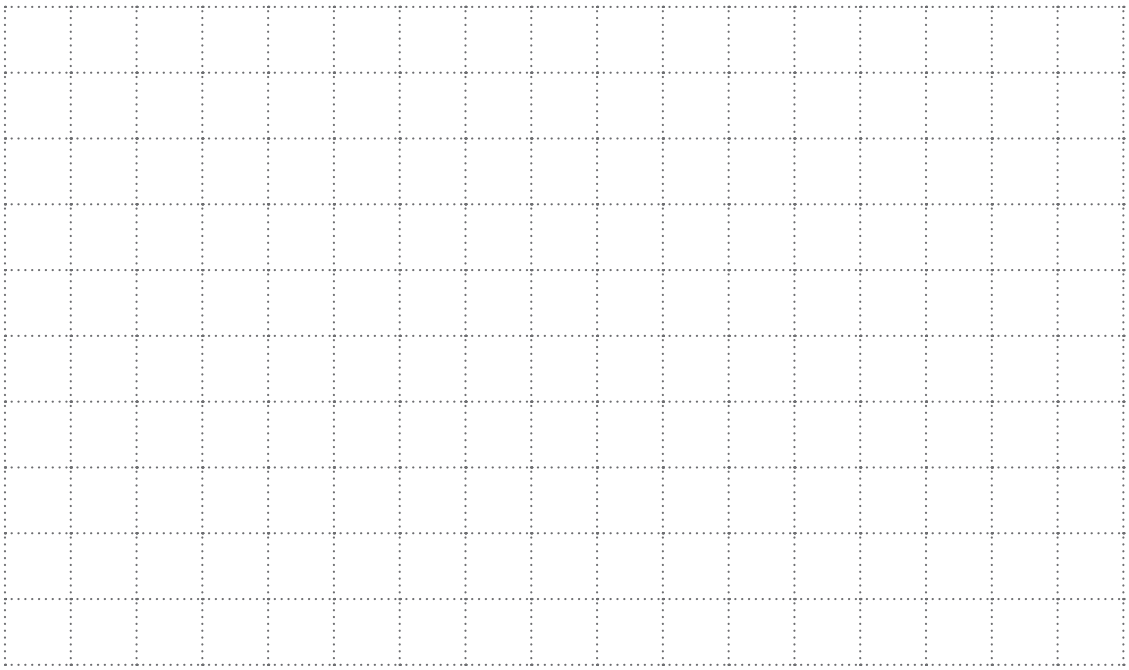
d) Use your straight line from Question 1c) to predict the average petrol price in Gladstone in November 2025, rounded to the nearest cent per litre. *[1 mark]*

QUESTION 2 (5 marks)

a) Use Stimulus 1 in the stimulus book to construct a scatterplot of the average petrol prices in Bundaberg in November from 2010 to 2020, with time as the explanatory variable. *[3 marks]*



Note: If you make a mistake, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this book.

b) Use your scatterplot from Question 2a) to describe the association between the two variables in terms of direction and strength. *[2 marks]*

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QUESTION 3 (6 marks)

a) Use Stimulus 1 to determine the equation of the least-squares regression line for the average petrol prices (cents/L) in Bundaberg in November from 2010 to 2020. *[2 marks]*

b) Use Stimulus 1 to determine the correlation coefficient for the regression line from Question 3a). *[1 mark]*

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c) Use your result from Question 3a) to predict the average petrol price in Bundaberg in November 2025, rounded to the nearest cent per litre. *[3 marks]*

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QUESTION 4 (8 marks)

a) Use Stimulus 1 and your results from Question 3a) to construct a residual plot for the average petrol price (cents/L) in Bundaberg in November from 2010 to 2020. *[5 marks]*

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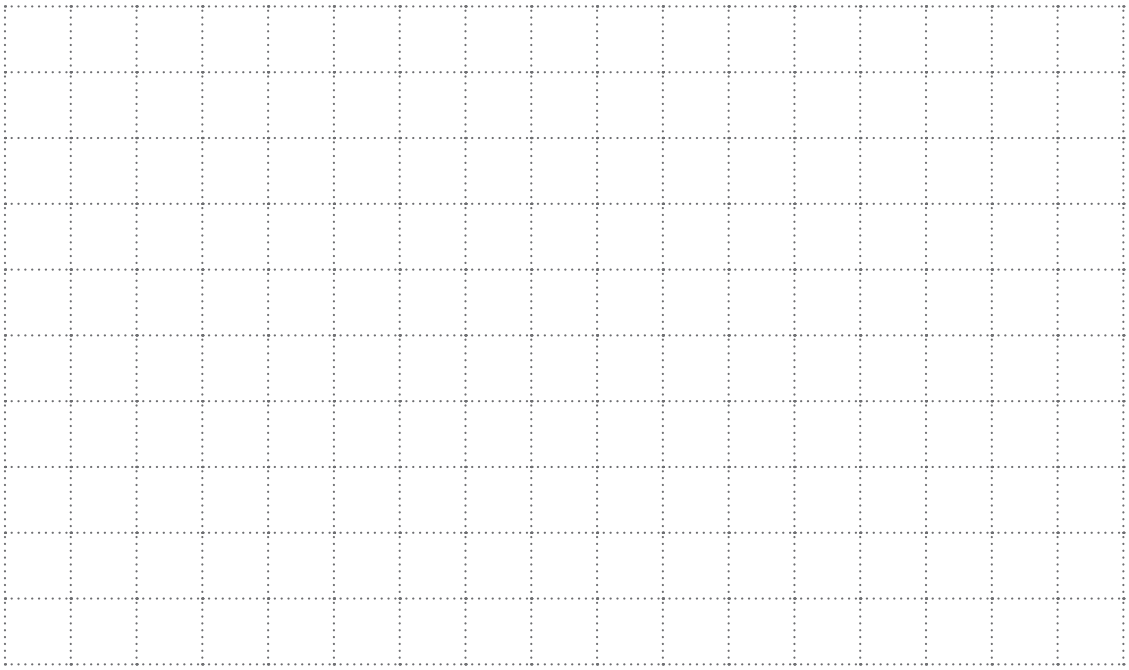

Note: If you make a mistake, cancel it by ruling a single diagonal line through your work and use the additional response space at the back of this book.

b) Use your results from Questions 3a), 3b) and 4a) to determine if the linear model is appropriate. You must reference your correlation coefficient from Question 3b). *[3 marks]*

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QUESTION 5 (13 marks)

a) Use Stimulus 2 in the stimulus book to deseasonalise the quarterly petrol prices (cents/L) in Hervey Bay in 2023 and 2024. Round the deseasonalised values to the nearest cent per litre. *[6 marks]*

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b) Use your results from Question 5a) to determine the least-squares line equation for the deseasonalised quarterly petrol prices (cents/L) in Hervey Bay in 2023 and 2024. Use $x = 1$ for the first quarter of 2023. *[2 marks]*

c) Use your results from Questions 5a) and 5b) to predict the actual quarterly petrol price in Hervey Bay for the last quarter of 2025, rounded to the nearest cent per litre. *[5 marks]*

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QUESTION 6 (13 marks)

Refer to Stimulus 3 in the stimulus book.

In November 2025, a student plans to drive a rental car from Hervey Bay to Gladstone and then back to Hervey Bay. On the way to Gladstone, they plan to visit a friend.

At the start of the drive, the rental car's 40 L petrol tank is full. The student will purchase petrol along the way and needs to ensure the rental car is returned in Hervey Bay with a full tank of petrol.

The student claims that even though the trip will be slightly longer, they will save money by driving through Bundaberg on the way back because they won't need to buy any petrol in Gladstone. However, they also claim that the difference in the distance travelled and the time taken will not affect their choice.

It is assumed that:

- your result from Question 1d) is the average petrol price (cents/L) in Gladstone in November 2025
- your result from Question 3c) is the average petrol price (cents/L) in Bundaberg in November 2025
- your result from Question 5c) is the average petrol price (cents/L) in Hervey Bay in November 2025
- the rental car has an average petrol consumption of 8.2 L/100 km.

a) Use Stimulus 3 and your results from Questions 1d), 3c) and 5c) to evaluate the reasonableness of the student's claims. Justify your response using mathematical reasoning. *[11 marks]*

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b) Identify and state the effect of one relevant strength and one relevant limitation of your evaluation in Question 6a). *[2 marks]*

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ADDITIONAL PAGE FOR STUDENT RESPONSES

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ADDITIONAL RESPONSE SPACE FOR QUESTION 1b)

If you want this response to be marked, draw a single diagonal line through your previous response.

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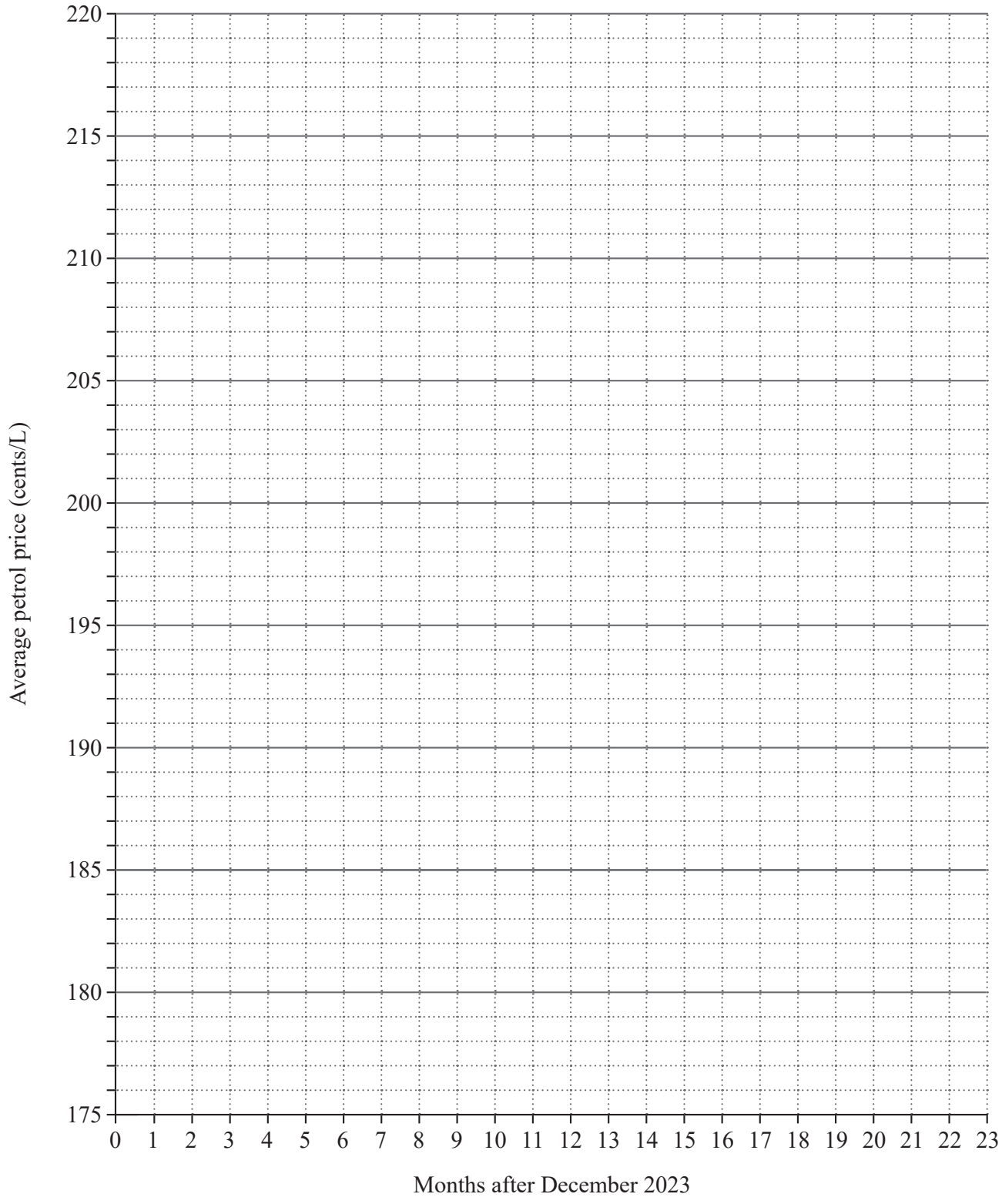
ADDITIONAL RESPONSE SPACE FOR QUESTION 1c)

If you want this response to be marked, draw a single diagonal line through your previous response.



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