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School code

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School name

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Given name/s

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Family name

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Attach your
barcode ID label here

Book of books used

External assessment 2022

Question and response book

General Mathematics

Paper 1

Time allowed

- Perusal time — 5 minutes
- Working time — 90 minutes

General instructions

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

Section 1 (15 marks)

- 15 multiple choice questions

Section 2 (42 marks)

- 10 short response questions





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THIS PAGE WILL NOT BE MARKED



Section 1

Instructions

- Choose the best answer for Questions 1–15.
- This section has 15 questions and is worth 15 marks.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- If you change your mind or make a mistake, use an eraser to remove your response and fill in the new answer bubble completely.

	A	B	C	D
Example:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	A	B	C	D
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Section 2

Instructions

- Write using black or blue pen.
 - 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.
 - This section has 10 questions and is worth 42 marks.
-

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QUESTION 16 (3 marks)

The table shows the number of sales for a small business in their first six months of trading.

Time in months, t	Number of sales, n
1	86
2	180
3	160
4	226
5	240
6	335

- a) Use your calculator to determine the equation of the least-squares line. *[1 mark]*

- b) Use the equation from Question 16a) to predict the number of sales in the 21st month. *[2 marks]*

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QUESTION 17 (4 marks)

An investment of \$50 000 that compounds interest monthly is modelled by the recurrence relation

$$A_{n+1} = 1.00375A_n \text{ where } A_0 = 50\,000.$$

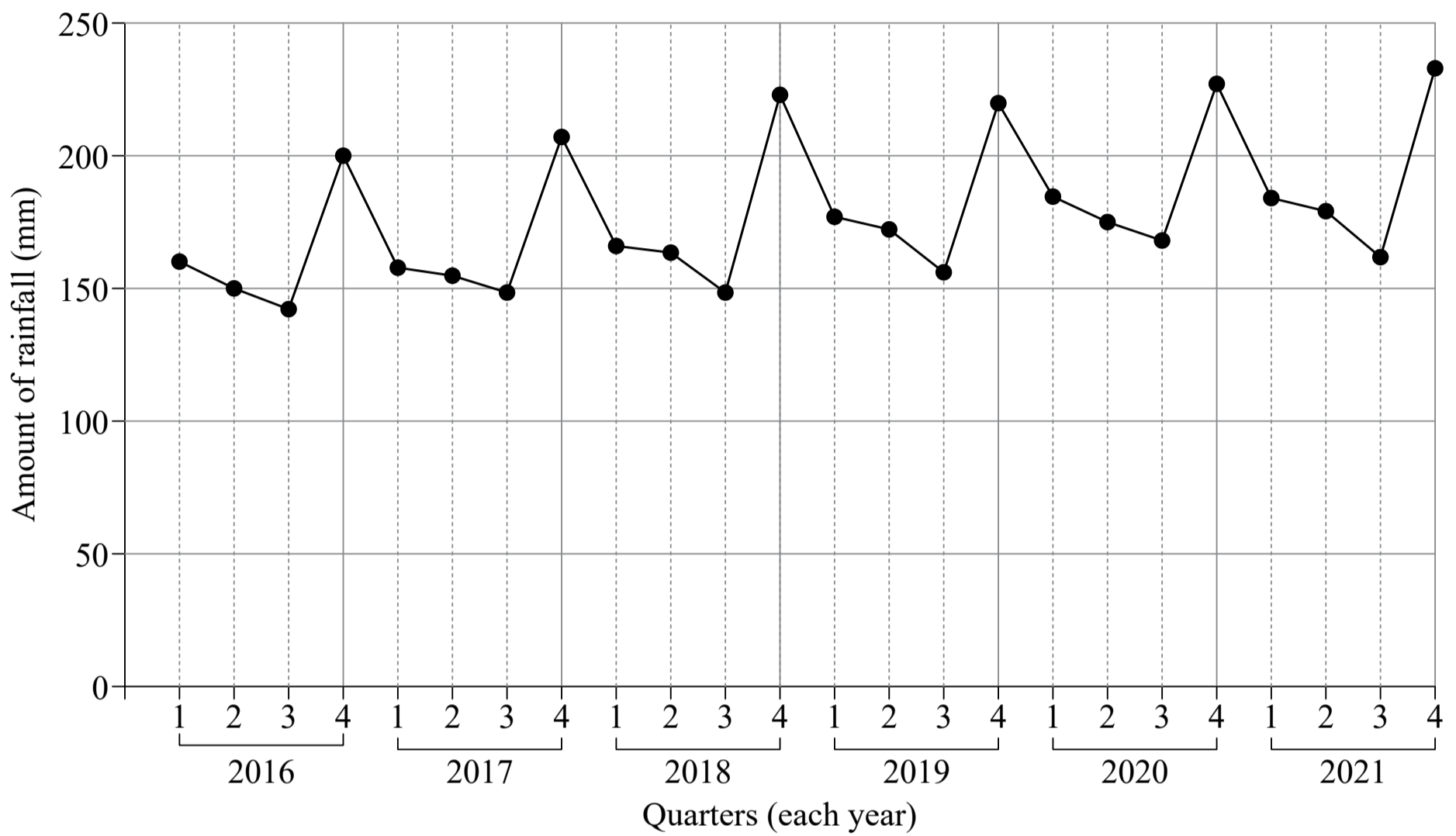
- a) What would be the advertised interest rate per annum, compounding monthly? *[2 marks]*

- b) How many months would it take for the value of the investment to exceed \$51 000? *[2 marks]*

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QUESTION 19 (4 marks)

The graph shows the amount of rainfall (in mm) for each quarter from 2016 to 2021.



a) Describe the long-term trend and seasonality of the time series data.

[2 marks]

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- b) A least-squares line was fitted to the data, with y representing the amount of rainfall and x representing the number of quarters since the beginning of 2016 (e.g. $x = 5$ for the first quarter of 2017).

$$y = 1.763x + 156.5$$

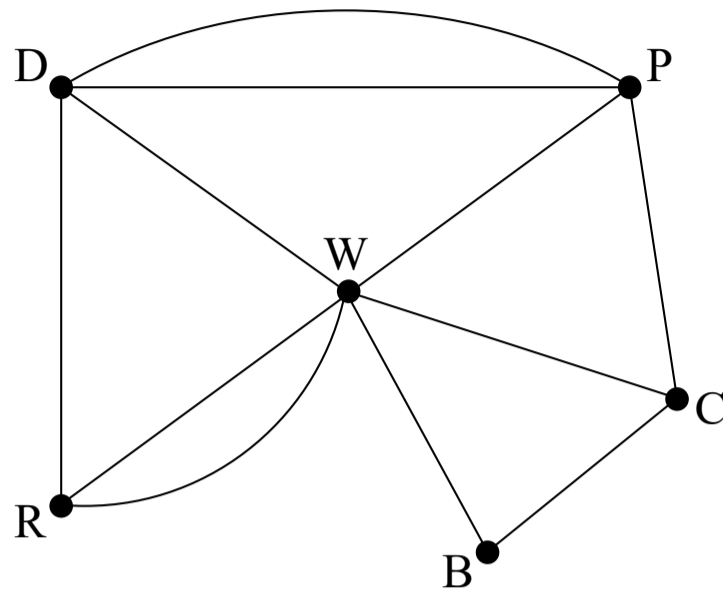
Interpret the y -intercept and slope of the fitted line.

[2 marks]

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QUESTION 21 (5 marks)

The paths connecting various landmarks in a park are shown.



Key	
B	Bus stop
C	Coffee shop
D	Duck pond
P	Playground
R	Rose garden
W	Water feature

a) Identify one cycle that passes through the rose garden and the playground. [1 mark]

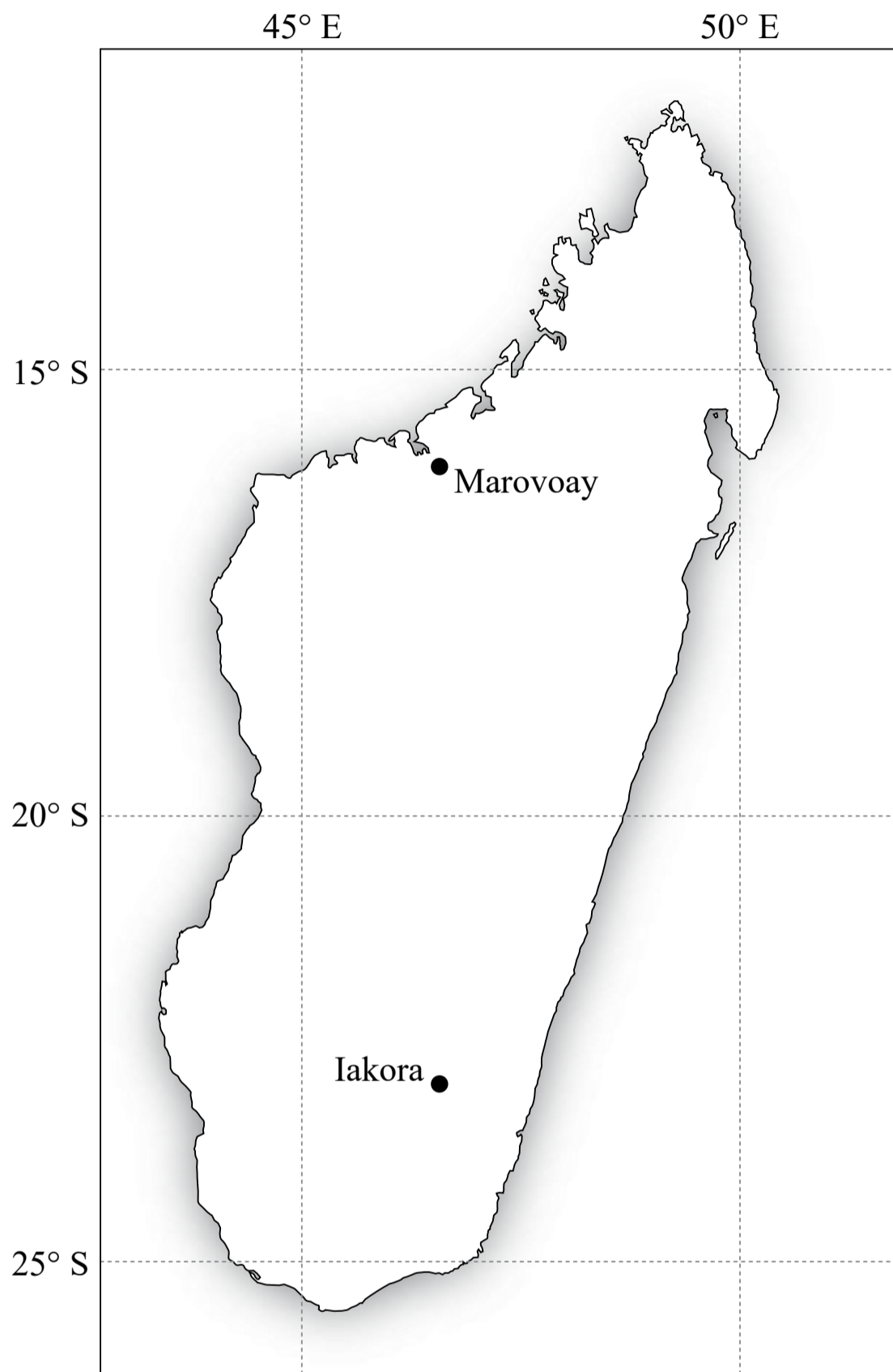
b) Identify whether the graph is Eulerian or semi-Eulerian. Justify your response. [2 marks]

c) Construct an adjacency matrix from the graph, using the vertex order listed in the key. [2 marks]

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QUESTION 22 (4 marks)

Marovoay and Iakora are located on the same meridian at 46.6° E, as shown on the map of Madagascar.



a) Determine the latitudes of Marovoay and Iakora.

[1 mark]

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b) Use the result from Question 22a) to determine the shortest distance between Marovoay and Iakora.

[3 marks]

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b) Use the equation from Question 23a) to predict the hourly pay of an employee with 15 years experience.

[2 marks]

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QUESTION 24 (5 marks)

The maximum temperature and the number of pies sold each day at a bakery are provided in the table.

Maximum temperature (°C)	29	20	31	27	23	25	22	33
Number of pies sold	32	39	25	33	37	35	37	30

a) Construct a scatterplot to display the data on the grid provided.

[3 marks]



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

b) Describe the association between the maximum temperature and the number of pies sold in terms of direction and strength.

[2 marks]

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