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School code

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Given name/s

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Family name

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Attach your
barcode ID label here

Book

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books used

External assessment 2021

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





DO NOT WRITE ON THIS PAGE

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 |
|-----|-----------------------|-----------------------|-----------------------|-----------------------|
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| 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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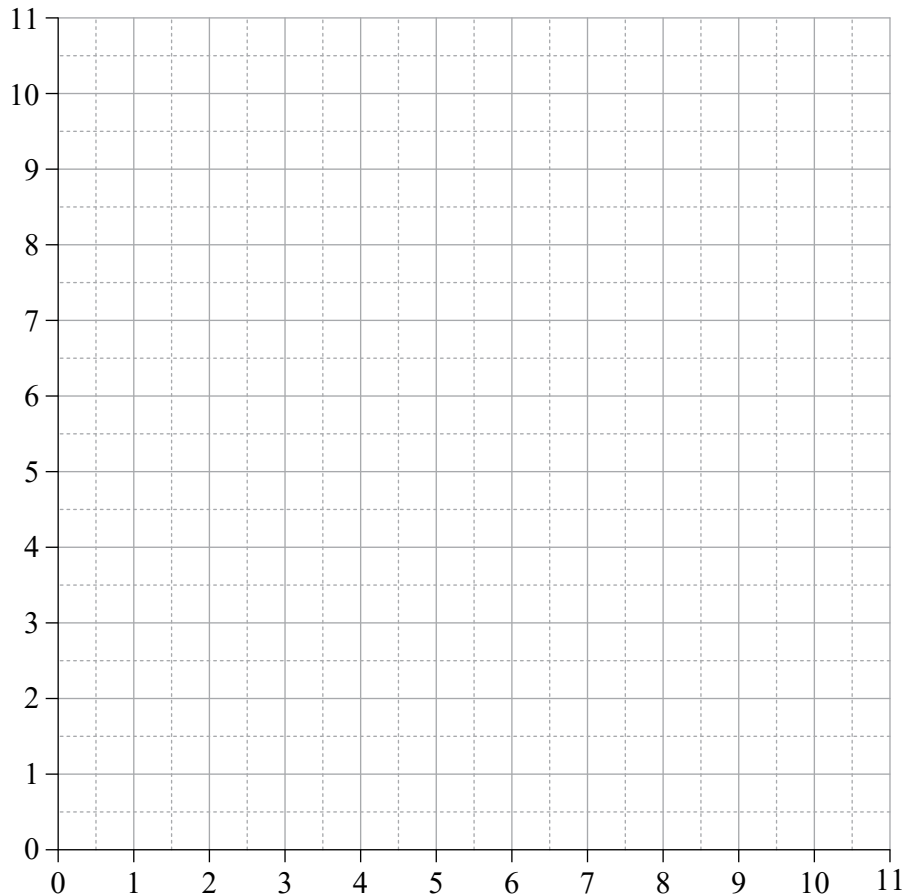
QUESTION 16 (4 marks)

The table shows the values of bivariate data with variables g and h .

| | | | | | | | |
|-----|-----|-----|-----|---|-----|-----|---|
| g | 9 | 2.5 | 4.5 | 8 | 6 | 3.5 | 1 |
| h | 3.5 | 6.5 | 10 | 6 | 9.5 | 9 | 3 |

a) Construct a scatterplot of the data with g as the explanatory variable.

[2 marks]



Note: If you make a mistake in the graph, cancel it by ruling a single diagonal line through your work and use the additional graph on page 21 of this question and response book.

b) Describe the association in terms of form and strength.

[2 marks]

Do not write outside this box.

QUESTION 17 (4 marks)

Determine the monthly repayment on a reducing balance loan of \$720 000 at 4.8% p.a. over 25 years.

Give your answer to the nearest dollar.

Do not write outside this box.

QUESTION 18 (4 marks)

The table shows the profit made each year (in thousands of dollars) by a small business.

| Year | Profit (\$'000s) |
|------|------------------|
| 2015 | 42.1 |
| 2016 | 36.9 |
| 2017 | 48.4 |
| 2018 | 52.3 |
| 2019 | 56.1 |
| 2020 | 59.8 |

- a) Use a mathematical model to determine the equation of the least-squares line to fit this data.

[2 marks]

- b) Use the least-squares line to forecast the profit in 2021, to the nearest hundred dollars.

[2 marks]

Do not write outside this box.

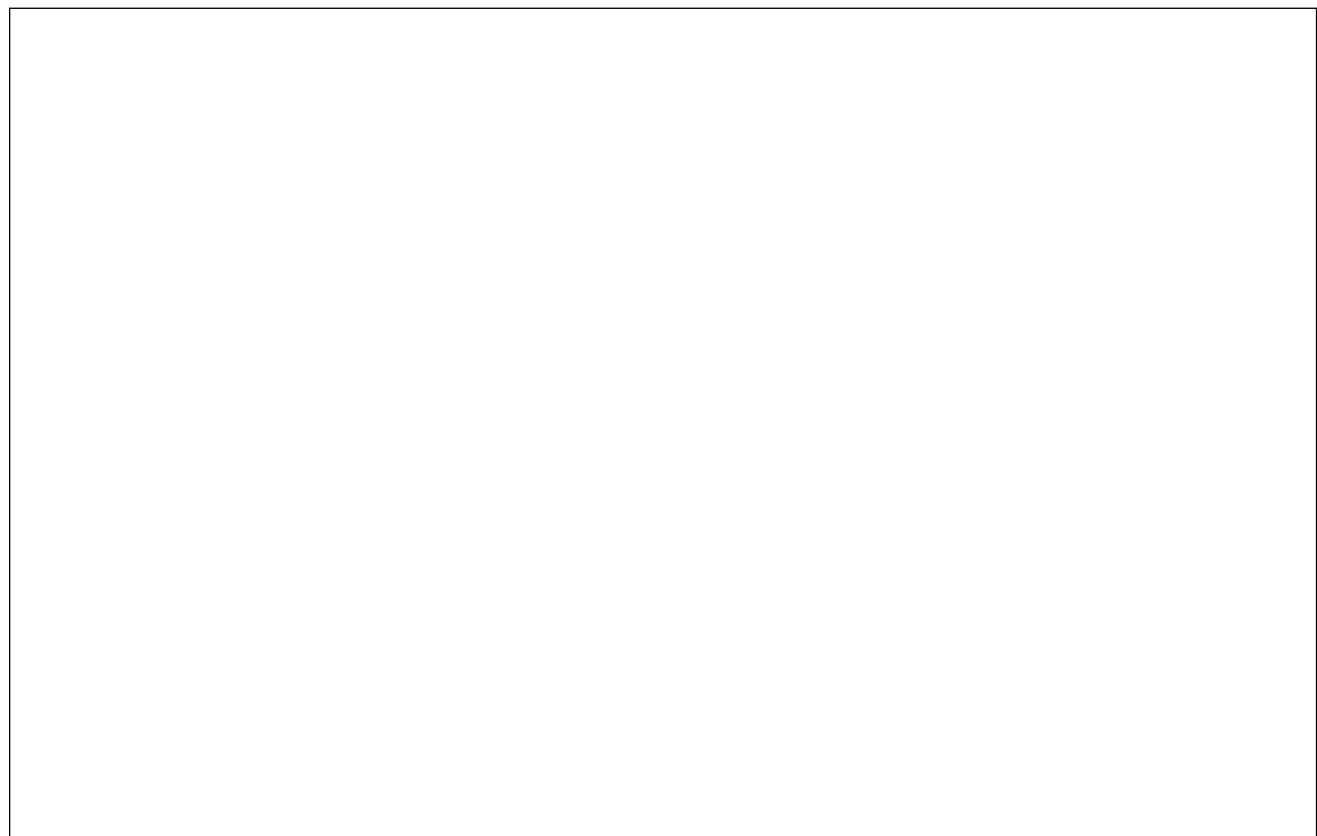
QUESTION 19 (5 marks)

The activity table for a project is shown.

| Activity | Prerequisite activity | Time (days) |
|----------|-----------------------|-------------|
| A | — | 2 |
| B | — | 4 |
| C | A | 3 |
| D | B | 6 |
| E | D | 3 |
| F | C, E | 4 |
| G | D | 8 |
| H | F, G | 4 |

- a) Use the activity table to construct a network diagram, including earliest and latest starting times.

[3 marks]



Note: If you make a mistake in the diagram, cancel it by ruling a single diagonal line through your work and use the additional response space on page 20 of this question and response book.

Do not write outside this box.

b) Determine the critical path.

[1 mark]

c) Determine the shortest completion time for the project.

[1 mark]

QUESTION 20 (4 marks)

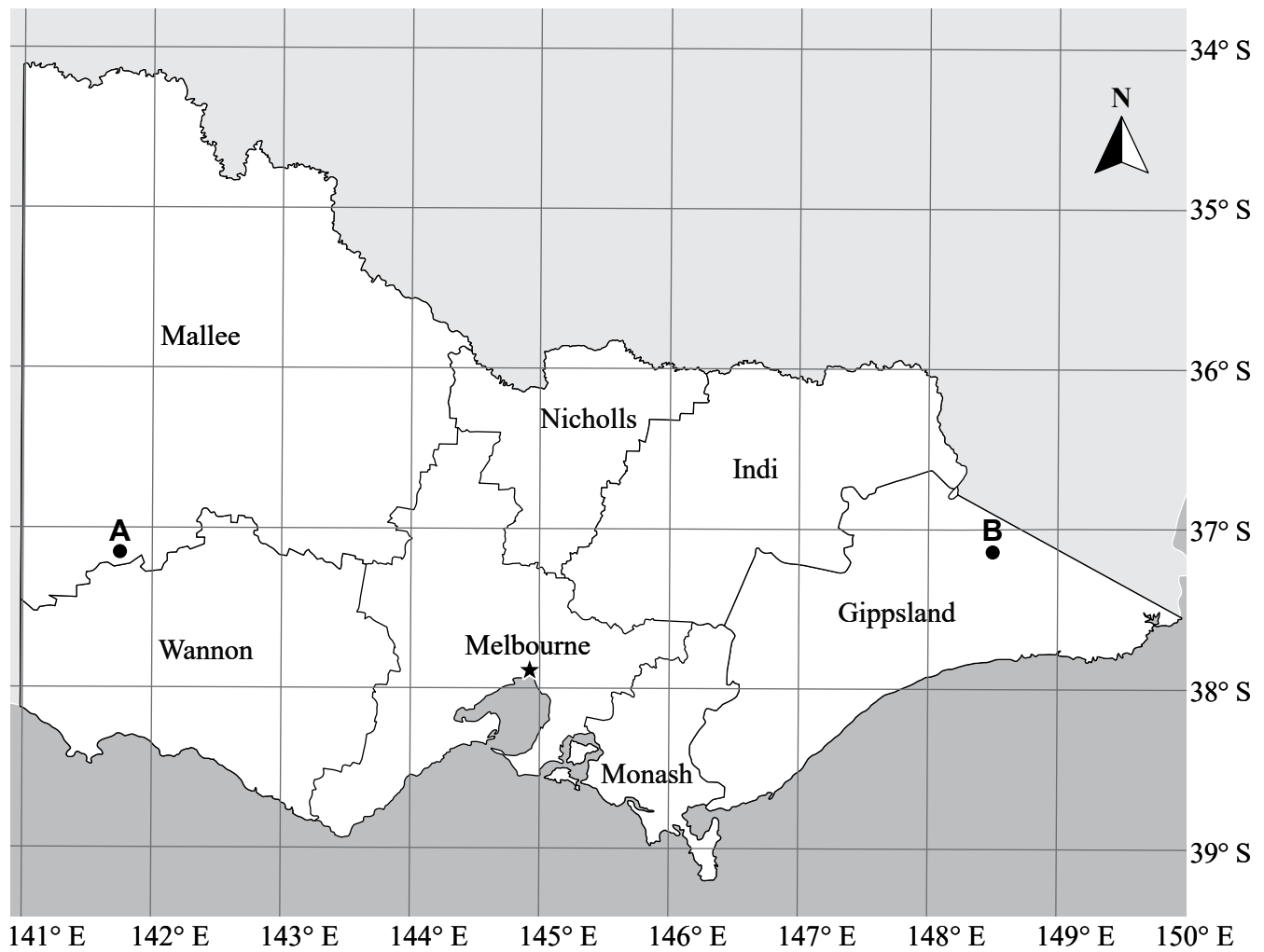
A farmer bought a tractor for \$45 100 at the start of 2012. It depreciates by \$2700 each year.

Identify and use a mathematical model to determine the value of the tractor at the start of 2021.

Do not write outside this box.

QUESTION 21 (6 marks)

The map shows regional federal electorates in Victoria.



a) In which federal electorate is the position 37° 10' S, 146° 30' E? [1 mark]

Do not write outside this box.

b) Determine the distance between point A in the electorate of Mallee and point B in the electorate of Gippsland along the same parallel of latitude, to the nearest 100 km.

[5 marks]

Do not write outside this box.

QUESTION 22 (4 marks)

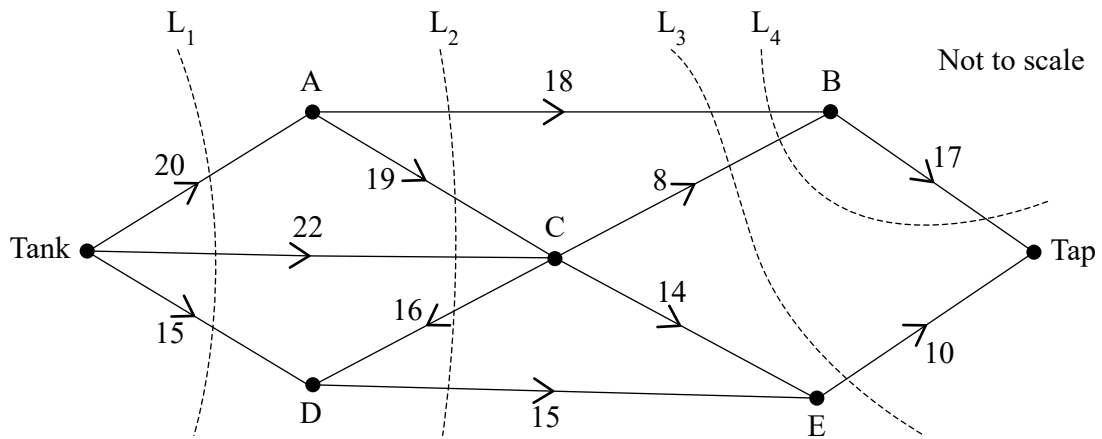
Rosa borrowed \$32 000 as a reducing balance loan at 4.8% p.a. compounding monthly, with monthly repayments of \$278.

How much will Rosa owe after 2 months, to the nearest cent?

Do not write outside this box.

QUESTION 23 (4 marks)

The network diagram shows the flow of water from the tank (source) to the kitchen tap (sink).



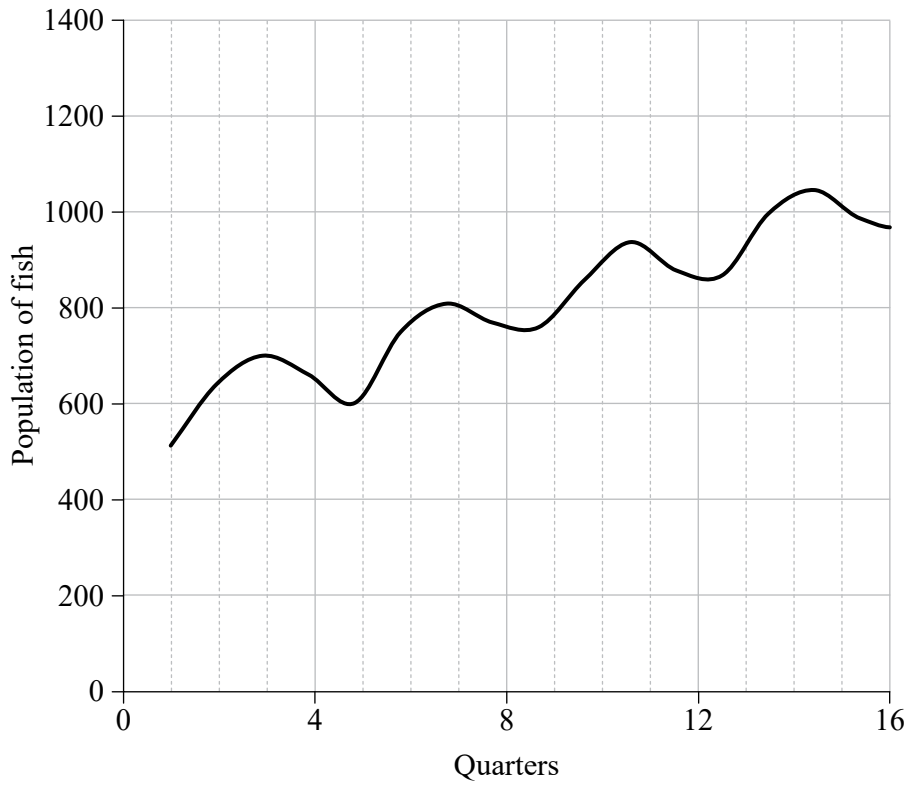
a) Explain which dashed line (L_1 , L_2 , L_3 or L_4) is not a valid cut. [1 mark]

b) Calculate the capacity of each dashed line that is a valid cut. [3 marks]

Do not write outside this box.

QUESTION 24 (3 marks)

The population of fish in a fish farm pond was recorded every three months. The graph shows the data.



Describe the time series plot by identifying three key features.

Do not write outside this box.

QUESTION 25 (4 marks)

A conference is being held in Singapore (UTC +8).

- a) A conference attendee got a flight from Brisbane (UTC +10) at 10:30 am Brisbane time on Monday 7 December.

If the flight from Brisbane to Singapore took 7 hours and 40 minutes, determine the time, day and date in Singapore when the flight lands.

[2 marks]

- b) A conference attendee from Dubai (UTC +4) arrived in Singapore at 5 pm Singapore time on Monday 7 December.

If the flight from Dubai to Singapore took 8 hours and 25 minutes, determine the time, day and date in Dubai when the flight departed.

[2 marks]

END OF PAPER

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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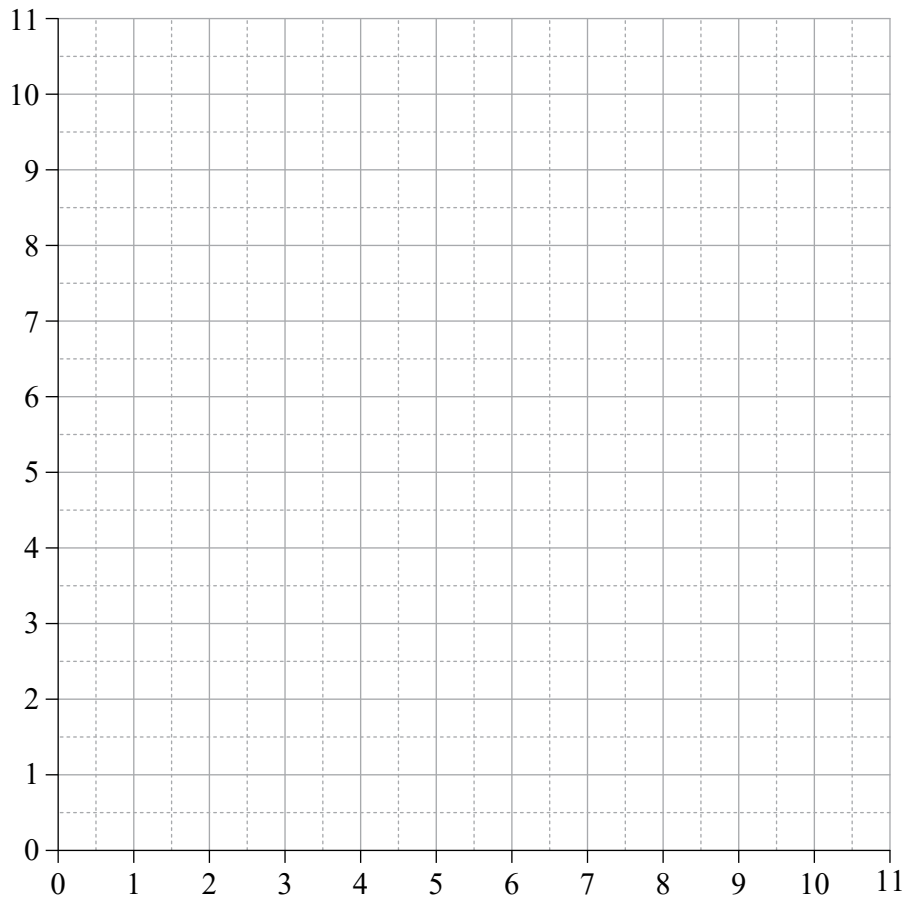
ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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ADDITIONAL RESPONSE SPACE FOR QUESTION 16a)

If you want this graph to be marked, rule a single diagonal line through the graph on page 3.



Do not write outside this box.



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