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External assessment 2022

Question and response book

General Mathematics

Paper 2

Time allowed

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

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Cut off after completion of assessment

Section 1 (38 marks)

- 7 short response questions

LUI

School code

School name

Given name/s

Family name

Book of books used

Attach your barcode ID label here

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.

Do not write on this page

This page will not be marked

Do not write outside this box.

Question 1 (4 marks)

The table shows a swimwear company's seasonally adjusted swimsuit sales (in thousands).

	Season			
	Spring	**Summer**	**Autumn**	**Winter**
Seasonally adjusted swimsuit sales (in thousands)	33.3	34.8	36.4	35.8

The long-term seasonal indices for spring, summer and winter are 1.11, 1.42 and 0.62 respectively.

Determine the actual swimsuit sales for autumn.

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Question 2 (5 marks)

Tam deposits a fixed amount at the end of each month into an account paying 8.6% p.a. compounding monthly. From an initial zero balance, she accumulates $51 343.85 in four years.

A financial planner has advised Tam that she would have been at least $3000 better off if she had instead deposited half of the fixed amount at the end of each fortnight into an account paying 7.9% p.a. compounding fortnightly.

Evaluate the reasonableness of this advice.

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Question 3 (5 marks)

In a company's first 10 years of operation, the average annual profit ($\overline{y}$) was \$9660 with a standard deviation (s_y) of \$3010. Fitting a least-squares line to the data comparing annual profit (y) to the year of operation (x) produced a correlation coefficient of 0.9987.

Show that the predicted profit, to the nearest dollar, for this company in the 11th year of operation will be \$15 121.

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Question 4 (5 marks)

The table shows the current road length (in kilometres) between six towns.

	Manon	Veria	Bolint	Farra	Recen	Alin
Manon		16	34	—	—	33
Veria			12	—	—	15
Bolint				—	10	—
Farra					15	23
Recen						15
Alin						

The government plans to build a direct road between Manon and Farra.

Use a network diagram to determine the length of the direct road if it is to be 4 km shorter than the length of the current shortest road route between Manon and Farra.

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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 at the back of this question and response book.

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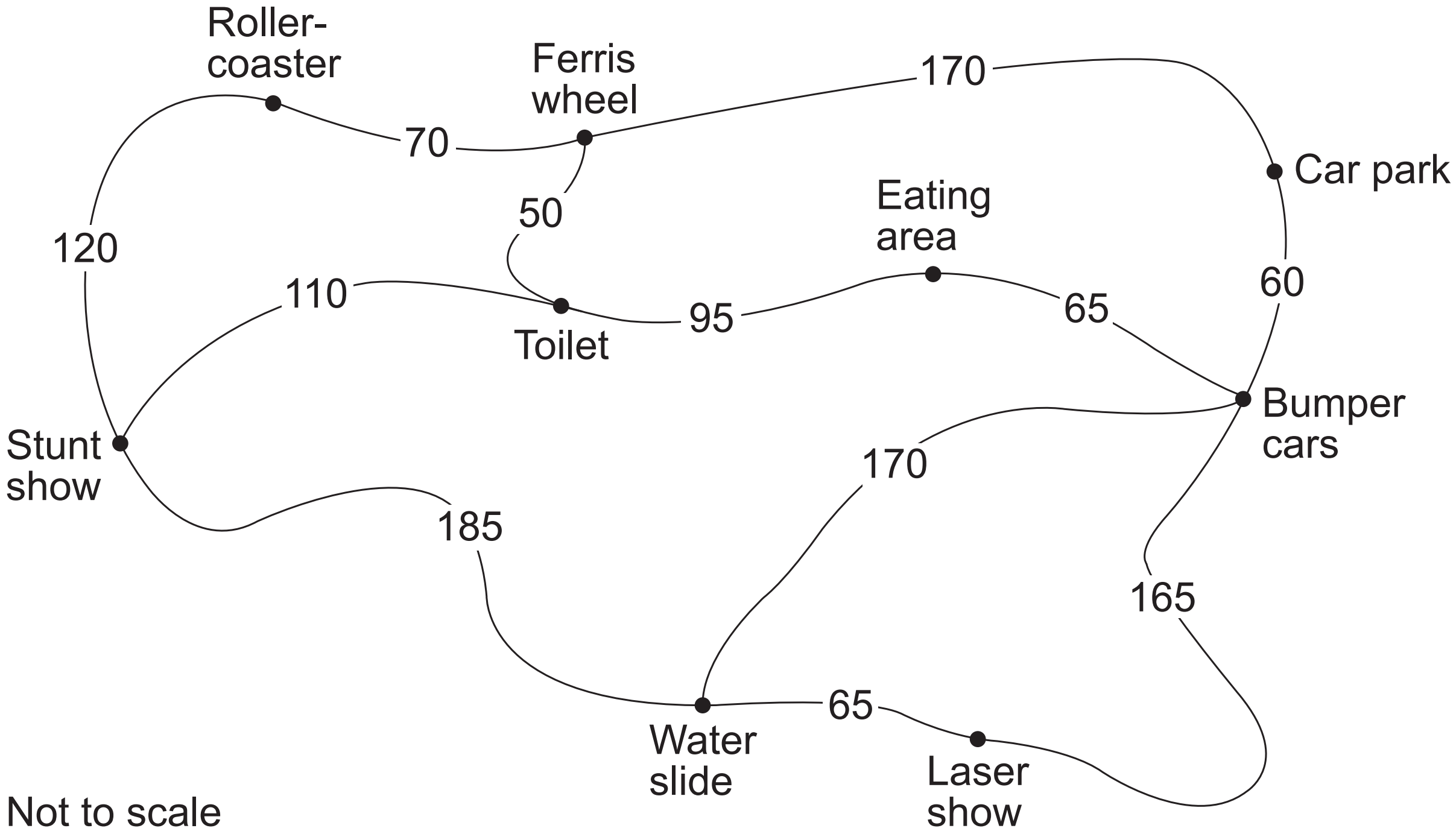
Continue to the next page

Question 5 (5 marks)

The map details the length (in metres) of paths between nine key locations in a theme park. The annual cost to maintain the paths is $214 per metre. The theme park manager believes at least $138 000 can be saved each year if some paths are removed, while still allowing visitors to access every key location using paths.



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Evaluate the reasonableness of the manager’s belief.

Question 6 (7 marks)

The first three lines in a pattern have the equations given. Their slopes form the terms of one sequence and their *y*-intercepts form the terms of another sequence. Each sequence is either arithmetic or geometric.

Line 1: $y = -0.8x + 1.2$

Line 2: $y = 0.4x + 2.7$

Line 3: $y = -0.2x + 4.2$

Determine the coordinates of the point where Line 5 in the pattern intersects Line 1.

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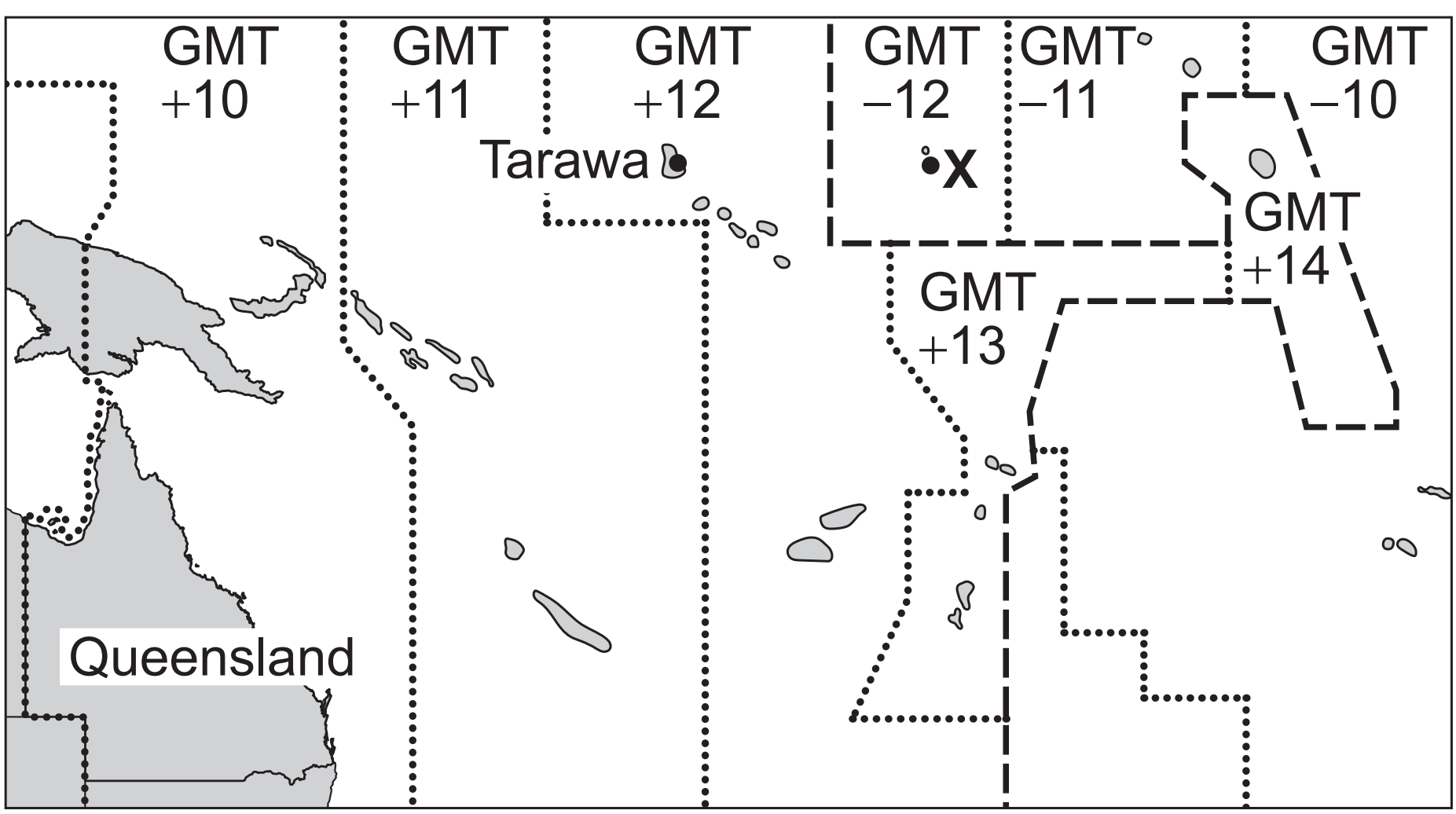
Question 7 (7 marks)

You live in Queensland and your friend is on a cruise ship holiday.

As their ship departs from **X** to travel 1350 km due west to Tarawa, your friend sends you a message saying 'Local time 6:12 am Wednesday and enjoying the sunrise as our ship begins its trip to Tarawa'.



Not to scale

Key

- – – – International date line
- ..... Time zone

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You plan to phone your friend as soon as they arrive in Tarawa.

Assuming their ship is travelling at 50 km/h, determine the time in Queensland when you will phone your friend.

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End of paper

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Additional page for student responses

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