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Venue 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

Sample assessment 2020

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 calculator permitted.
- QCAA formula sheet provided.
- Planning paper will not be marked.

Section 1 (20 marks)

- 20 multiple choice questions

Section 2 (40 marks)

- 10 short response questions



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DO NOT WRITE ON THIS PAGE

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Section 1

Instructions

- Choose the best answer for Questions 1–20.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- This section has 20 questions and is worth 20 marks.
- 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"/>
16.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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 40 marks.

QUESTION 21 (4 marks)

To provide herself with a regular income at retirement, Mary invests in an annuity worth \$270 000 at 3.5% per annum compounding monthly for 20 years.

Calculate how much income she will receive each month.

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b) Use the rule $t_n = t_1 + (n - 1)d$ to model the sequence in simplified form.

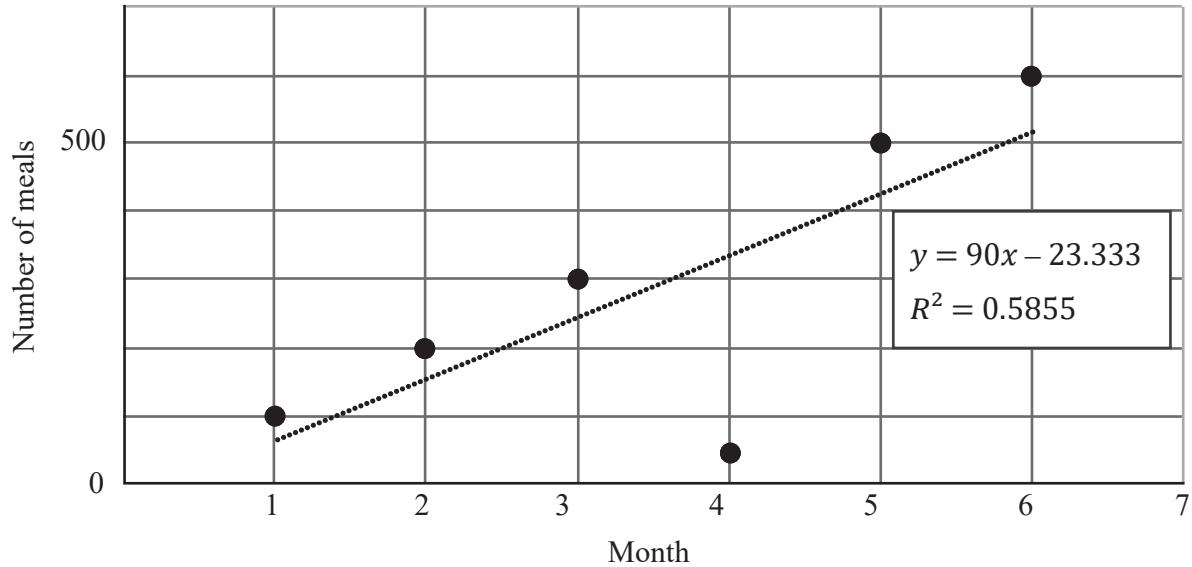
[2 marks]

c) Use the results from 22b) to calculate the 27th term.

[2 marks]

QUESTION 23 (6 marks)

The number of meals sold (y) by a restaurant each month (x) for the first six months of business is shown on the scatterplot below. The line of best fit, its equation and the coefficient of determination (R^2) are also shown.



The restaurant was closed for renovations for most of one month.

- a) Identify the number of meals sold in that month. [1 mark]

- b) Describe the effect that this outlier has on the coefficient of determination. [1 mark]

c) Use the line of best fit to predict the number of meals that will be sold in the 18th month of the business operation.

[2 marks]

d) Evaluate the reasonableness of your solution for 23c).

[2 marks]

QUESTION 24 (4 marks)

Students were surveyed regarding their attitudes towards dancing and swimming. The resulting data is displayed in the table below.

	Enjoy dancing	Do not enjoy dancing
Enjoy swimming	33	132
Do not enjoy swimming	110	58

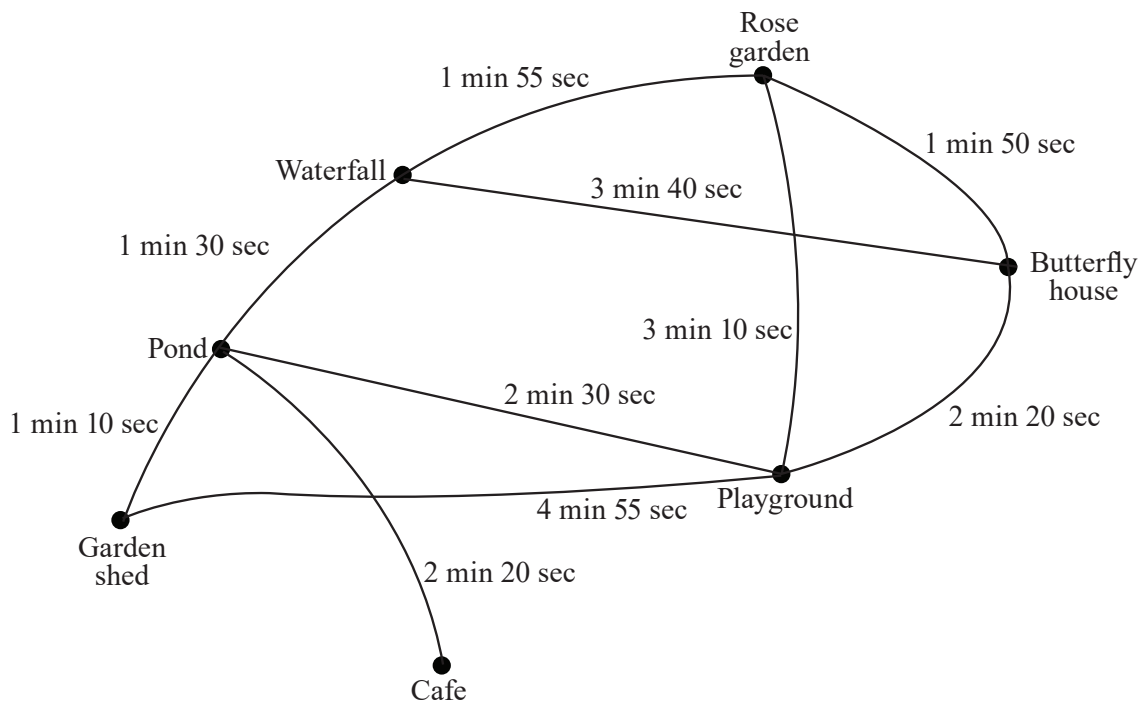
a) Calculate how many students enjoy swimming. *[1 mark]*

b) Calculate how many students were surveyed. *[1 mark]*

c) Calculate the percentage of students who enjoy both activities. Express your answer correct to two decimal places. *[2 marks]*

QUESTION 25 (3 marks)

The connected weighted graph below shows the time taken in minutes and seconds to walk between places in a park.



- a) Identify which two places are joined by a network bridge. [1 mark]

- b) Calculate the earliest time that a gardener could arrive at the butterfly house if they leave the garden shed at 8:55 am. [2 marks]

QUESTION 26 (2 marks)

The number of students (s) and the number of computers (c) in four secondary schools in Queensland are shown in the table below.

Number of students (s)	Number of computers (c)
348	307
507	427
798	671
1202	986

- a) Identify the response variable. *[1 mark]*

- b) Determine a linear relationship for this data by fitting a least-squares line to the data. *[1 mark]*

QUESTION 27 (3 marks)

Use the recursive rule $t_{n+1} = 0.65t_n$, $t_1 = 120$ to complete the following.

- a) Calculate the percentage by which each term decreases. *[1 mark]*

- b) Calculate t_4 . *[2 marks]*

QUESTION 28 (3 marks)

The approximate coordinates of Geelong, Australia, are $38^{\circ}09' S$, $144^{\circ}21' E$ and Kushiro, Japan, are $43^{\circ}01' N$, $144^{\circ}21' E$.

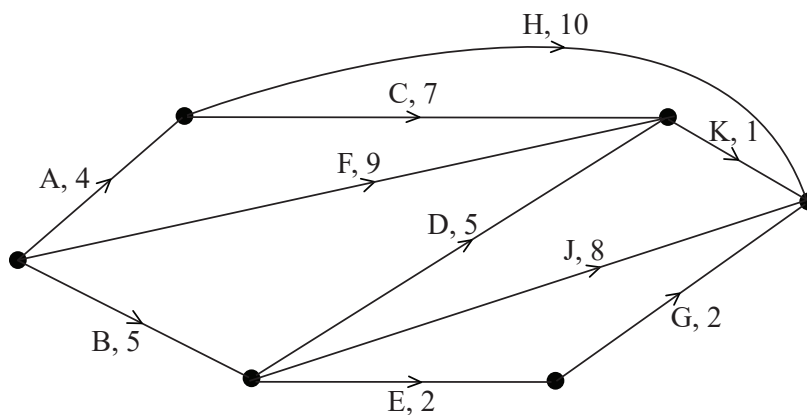
Calculate the distance between Geelong and Kushiro to the nearest kilometre.

QUESTION 29 (4 marks)

Seoul, South Korea, is located at approximately $37.6^{\circ} N$, $127.0^{\circ} E$. San Francisco, United States of America, is located at approximately $37.6^{\circ} N$, $122.4^{\circ} W$. Determine the shortest distance between these two cities to the nearest kilometre.

QUESTION 30 (4 marks)

The network diagram below illustrates the time taken in days for 10 different activities, labelled A–K, involved in the completion of a task.



a) Identify the critical path for the diagram above. [1 mark]

b) Calculate the latest starting time for Activity G. [1 mark]

c) Calculate the float time for Activity E. [2 marks]

END OF PAPER

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Area with horizontal lines for student responses.

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