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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

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of

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books used

External assessment

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.
- Ruler required.
- QCAA formula sheet provided.
- Planning paper will not be marked.

Section 1 (50 marks)

- 6 short response questions





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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 (2 marks)

Use the information provided in Stimulus 1 in the stimulus book to create a scatterplot.

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 paper on page 15 of this question and response book.

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QUESTION 3 (11 marks)

Use Stimulus 1 to develop a geometric model that can be used to predict the height of the world's highest building, based on the year of completion. The model must pass through data points representing the Woolworth Building and the Burj Khalifa.

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QUESTION 4 (13 marks)

Residual plots can be used to compare different types of models, including geometric and linear. A random pattern of small residuals shows a model that is a better representation of the data than either a non-random pattern or a pattern with larger residuals.

Evaluate the reasonableness of the models developed in Questions 2 and 3 by drawing and analysing the residual plots for each model to determine which is the more valid representation of the data. Use the response lines and the graph paper provided.

Do not write outside this box.



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 paper on page 16 of this question and response book.

QUESTION 5 (14 marks)

The Ultima Tower was designed to be built in San Francisco, USA. The silhouette of the proposed building is visible in Stimulus 2 in the stimulus book.

Using Stimulus 1, 2 and 3 in the stimulus book, and the best model identified in Question 4, justify whether it would be expected that most children born in Australia in 2021 will live to see the Ultima Tower completed. Use the response lines and the graph paper provided.

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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 paper on page 17 of this question and response book.

QUESTION 6 (6 marks)

Document the strengths and limitations of the life expectancy and building height models used in Question 5. Evaluate the reasonableness of using these models to make long-term predictions.

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ADDITIONAL RESPONSE SPACE FOR QUESTION 4

If you want this response to be marked, rule a diagonal line through the graph paper on page 7.

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