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School code

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School name

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Given name/s

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Attach your
barcode ID label here

Book

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of

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books used

External assessment 2023

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.
- QCAA formula book provided.
- Planning paper will not be marked.

Section 1 (50 marks)

- 7 short response questions





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Section 1

Instructions

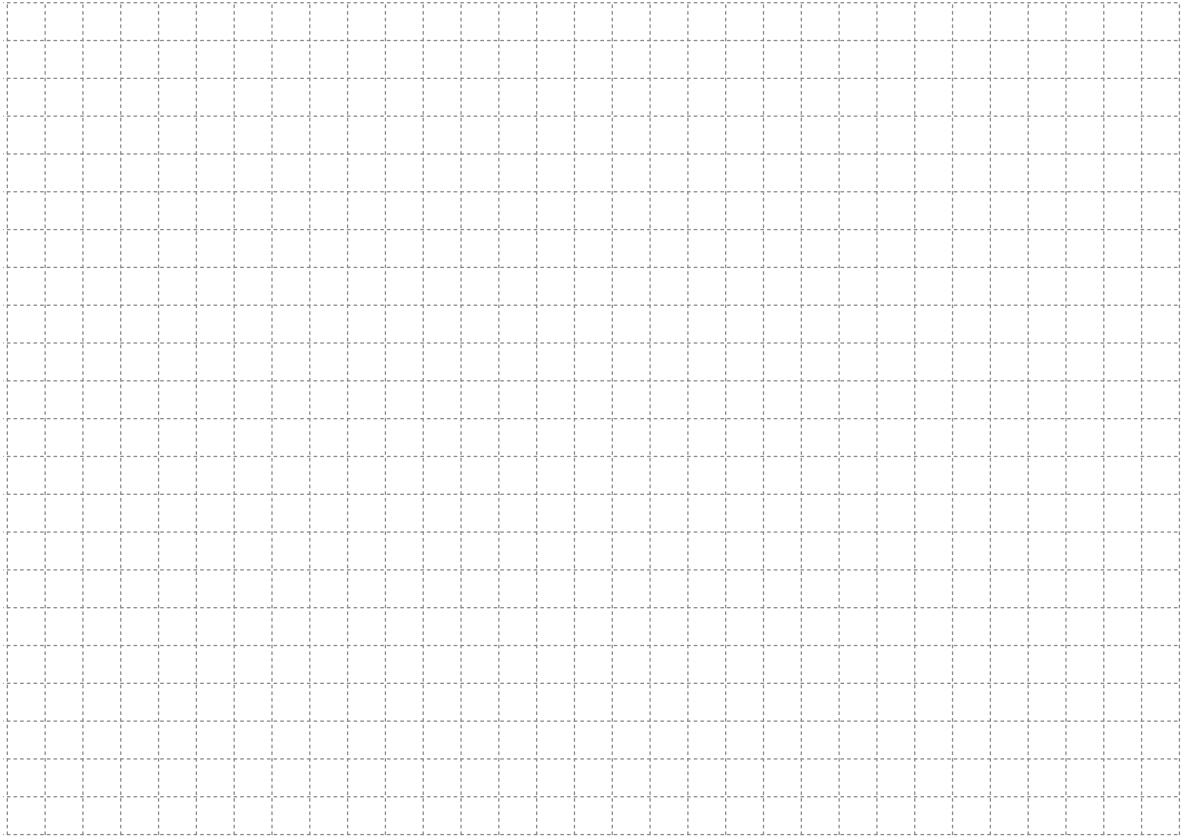
- Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
 - If you need more space for a response, use the additional pages at the back of this book.
 - On the additional pages, write the question number you are responding to.
 - Cancel any incorrect 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 data in Stimulus 1 in the stimulus book to create a scatterplot showing the relationship between average song length and the number of years since 1950.



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.

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QUESTION 2 (4 marks)

Use Stimulus 1 to develop a linear model that can be used to predict average song length based on the number of years since 1950.

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QUESTION 4 (15 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 a non-random pattern or a pattern with larger residuals.

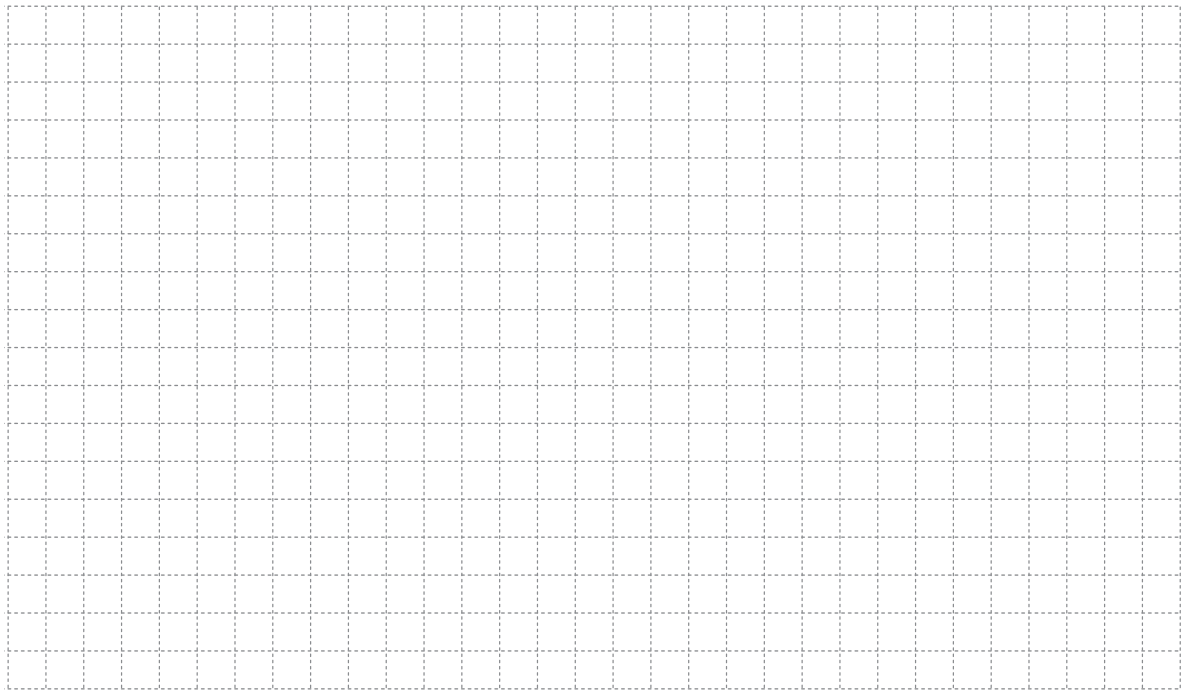
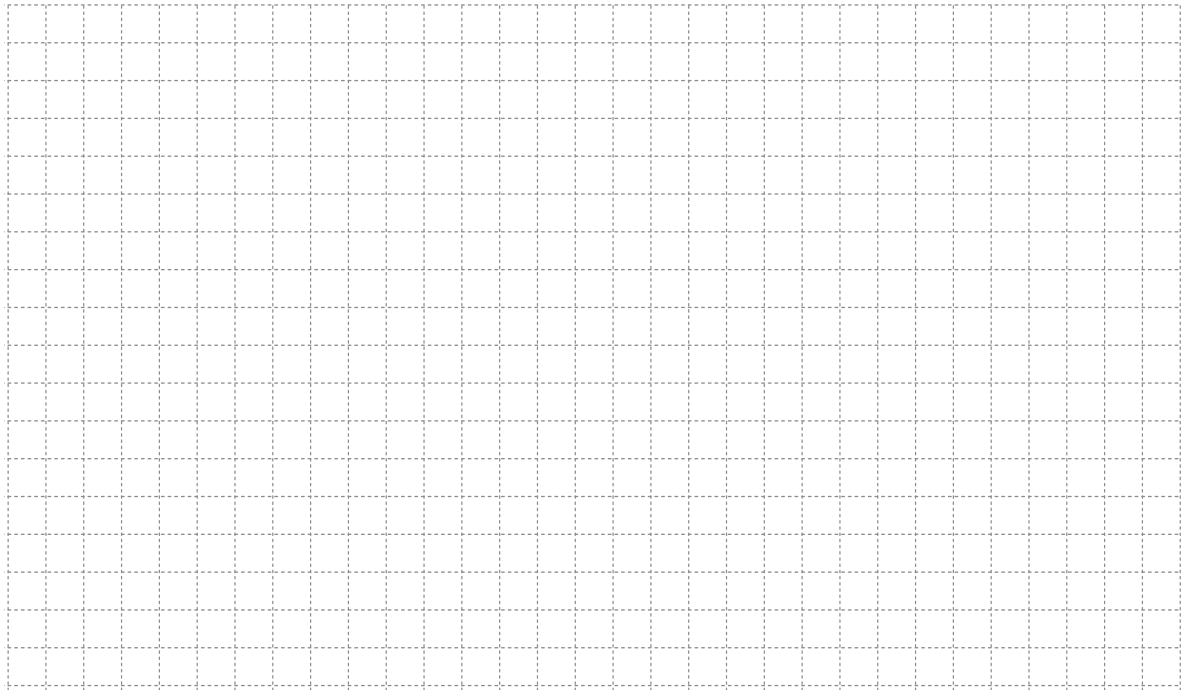
- a) Evaluate the reasonableness of the models you developed for Questions 2 and 3 by analysing their residual plots.

[14 marks]

- b) State which model is a more valid representation of the data.

[1 mark]

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Note: If you make a mistake in a residual plot, 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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QUESTION 6 (4 marks)

- a) Use Stimulus 2 in the stimulus book to calculate the residuals for the model you selected in Question 4b).

[2 marks]

- b) Use these residuals and Stimulus 3 in the stimulus book to determine if the model you selected in Question 4b) or model 3 from Question 5 is better for predicting average song length for the years 2000–2020. Justify your decision.

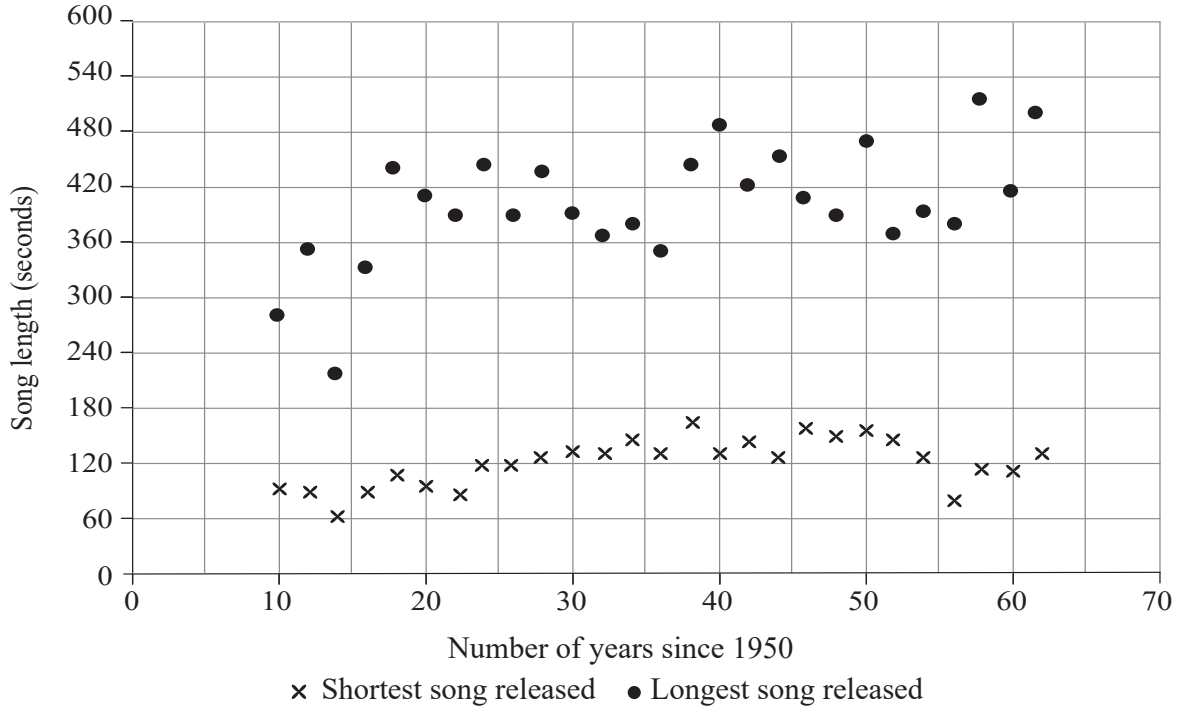
[2 marks]

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QUESTION 7 (9 marks)

- a) Sketch the model you selected in Question 4b) and model 3 from Question 5 on the Cartesian plane. Add corresponding labels to the key. The length of the longest and shortest song released every second year are already recorded.

[3 marks]



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

- b) Use Questions 4, 5, 6 and 7a) to determine the best way to model the data from 1960–2020. Use Stimulus 4 in the stimulus book and Question 7a) to justify the reasonableness of your selection.

[3 marks]

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- c) Use your answer from Question 7b) to predict the average song length in 2050. Use Stimulus 4 and 5 in the stimulus book to justify the reasonableness of your prediction. *[3 marks]*

END OF PAPER

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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ADDITIONAL PAGE FOR STUDENT RESPONSES

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

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ADDITIONAL PAGE FOR STUDENT RESPONSES

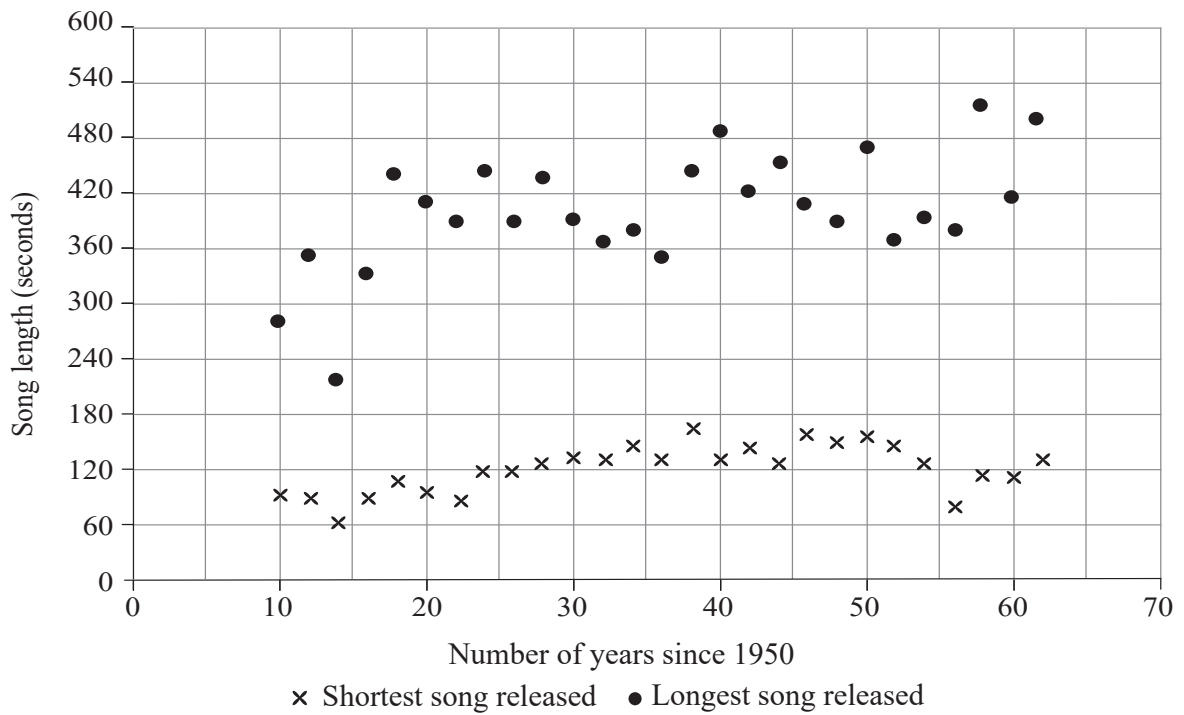
Write the question number you are responding to.

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ADDITIONAL PAGE FOR STUDENT RESPONSES

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