

Mathematical Methods

Units 3 & 4 Practice Exam A, 2019

Paper 1 of 2 – technology-free

Time allowed

Perusal – 5 minutes

Working time – 90 minutes

General instructions

- Answer all questions in this question and response book.
- Calculators are not permitted.
- QCAA formulae sheet provided.
- Planning paper will not be marked.

Section 1 (10 marks)

- 10 multiple choice questions.

Section 2 (60 marks)

- 9 short response questions.

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SAMPLE

Section 1

Instructions

- Choose the best answer for Questions 1-10
- This section has 10 questions and is worth 10 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
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"/>

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Section 2**Instructions**

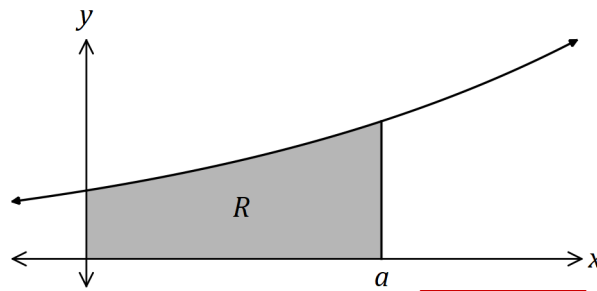
- Write using black or blue pen.
 - Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
 - If you need more space for a response, use the additional pages at the back of this book.
 - On the additional pages, write the question number you are 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 nine questions and is worth 60 marks.
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QUESTION 11 (6 marks)

The shaded region R , shown on the graph below, is bounded by the curve $y = e^{3x}$ and the lines $y = 0$, $x = 0$ and $x = a$.



- (a) Determine the area of R in terms of a . (3 marks)
- (b) Determine, in simplest form, the value of a for which the area of R is 21 square units. (3 marks)

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QUESTION 12 (5 marks)

(a) Simplify $\log_2(16) \div \log_5(125^2)$. (2 marks)

(b) Solve the equation $\ln(4 - x) + \ln 2 = 2 \ln x$. (3 marks)

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QUESTION 13 (7 marks)

The graph of $y = 2x^2e^{-x}$ has one local minimum and one local maximum.

- (a) Determine the x -coordinates of the stationary points of the graph. (3 marks)
- (b) Use the second derivative test to determine which of the points from (a) is a local maximum and state the coordinates of this point. (4 marks)

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