

Cambridge International AS & A Level

CANDIDATE NAME			
CENTRE NUMBER		CANDIDATE NUMBER	
MATHEMATIC	cs		9709/2
Paper 2 Pure M	lathematics 2		May/June 202
		AHA	1 hour 15 minute
You must answ	er on the qu estion paper.		
You will need:	List of formulae (MF19)		
INSTRUCTION • Answer all	s questions.		3 T

- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do not use an erasable pen or correction fluid.
- Do not write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages.

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•,	Solve the equation $ln(2 + x) - ln x = 2 ln 3$.	[3
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)	Hence solve the equation $\ln(2 + \cot y) - \ln(\cot y) = 2 \ln 3$ for $0 < y < \frac{1}{2}\pi$. Give your answer co to 4 significant figures.	rrec [2
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The solutions of the equation $5 x = 5 - 2x$ are $x = a$ and $x = b$, where $a < b$.		
Find the value of $ 3a - 1 + 7b - 1 $.	[5]	
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(a)	Find the exact value of $\int_0^2 6e^{2x+1} dx$.	[3]
(b)	Find $\int (\tan^2 x + 4\sin^2 2x) \mathrm{d}x.$	[5]

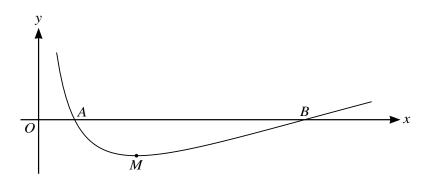


5	(a)	Find the quotient when $x^4 - 32x + 55$ is divided by $(x - 2)^2$ and show that the remainder is 7.



Factorise $x^* - 32x + 48$.	[2]
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Thence solve the equation e = 7 - 32e = 7 + 40 = 0, giving your answer in an exact form.	[2]
	•••••
	Hence solve the equation $e^{-12y} - 32e^{-3y} + 48 = 0$, giving your answer in an exact form.





The diagram shows the curve with equation

$$y = (\ln x)^2 - 2\ln x.$$

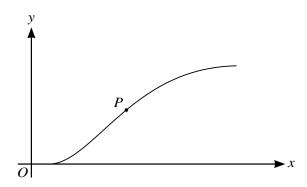
The curve crosses the x-axis at the points A and B, and has a minimum point M.

(a)	Find the exact value of the gradient of the curve at each of the points A and B .	[6]
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(b)	Find the exact x -coordinate of M .	[2]
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The diagram shows the curve with parametric equations

$$x = 4t + e^{2t}, \qquad y = 6t \sin 2t,$$

for $0 \le t \le 1$. The point *P* on the curve has parameter *p* and *y*-coordinate 3.

(a)	Show that $p = \frac{1}{2\sin 2p}$. [1]
(b)	Show by calculation that the value of p lies between 0.5 and 0.6. [2]
(c)	Use an iterative formula, based on the equation in part (a), to find the value of p correct to 3 significant figures. Use an initial value of 0.55 and give the result of each iteration to 5 significant figures. [3]



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(d)	Find the gradient of the curve at <i>P</i> .	[5]
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