

Cambridge International AS & A Level

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

0123456789

MATHEMATICS 9709/02

Paper 2 Pure Mathematics 2

For examination from 2020

SPECIMEN PAPER

1 hour 15 minutes

You must answer on the question paper.

You will need: List of formulae (MF19)

INSTRUCTIONS

- Answer all questions.
- 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 **14** pages. Blank pages are indicated.

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	Find the value of a .	
b)	When a has this value, find the remainder when $p(x)$ is divided by $(x + 3)$.	
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3	It is o	iven	that a	is a	nositive	constant.
J	IL IS E	,1 / (11	mai u	15 a	positive	Constant.

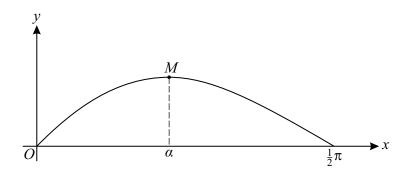
(a) (i)	Sketch on a single diagram the graphs of $y = 2x - 3a $ and $y = 2x + 4a $.	[2]
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(ii) State the coordinates of each of the points where each graph meets an axis. [1]

	ng your answer correct to 3 significant figures.	Sorre me equation 5
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]	Express y in terms of x , in a form not involving logarithms. [4]
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5



The diagram shows the curve $y = \frac{\sin 2x}{x+2}$ for $0 \le x \le \frac{1}{2}\pi$. The *x*-coordinate of the maximum point *M* is denoted by α .

dx	nd show that α	juution tun 23	230 1 1.	

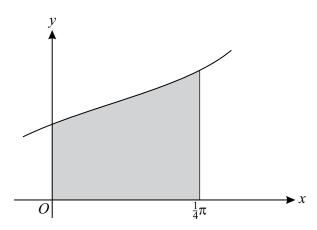
(b)	Show by calculation that α lies between 0.6 and 0.7.	[2]
(c)	Use the iterative formula $x_{n+1} = \frac{1}{2} \tan^{-1}(2x_n + 4)$ to find the value of α correct to 3 decimal place	es.
	Give the result of each iteration to 5 decimal places.	[3]
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	parametric equations of a curve are $x = e^{2t}$, $y = 4te^{t}$.	
(a)	Show that $\frac{\mathrm{d}y}{\mathrm{d}x} = \frac{2(t+1)}{\mathrm{e}^t}$.	

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	$\int_0^{\frac{1}{4}\pi} (\tan^2 x + \cos^2 x) \mathrm{d}x.$
	$\int_0^{\infty} (\tan^2 x + \cos^2 x) \mathrm{d}x.$

(b)



The region enclosed by the curve $y = \tan x + \cos x$ and the lines x = 0, $x = \frac{1}{4}\pi$ and y = 0 is shown in the diagram.

Find the exact volume of the solid produced when this region is rotated completely about th x -axis. [4]

Additional page

If you use the must be clearly	following lined p shown.	age to complet	e the answer(s	s) to any quest	ion(s), the ques	stion number(s)
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