1 hour 15 minutes



# Cambridge International AS & A Level

Paper 2 Pure N	Mathematics 2		May/June 2020
MATHEMATI	cs		9709/22
CENTRE NUMBER		CANDIDATE NUMBER	
CANDIDATE NAME			

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 [ ].

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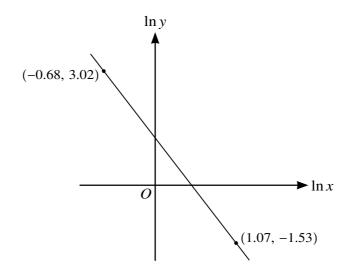
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	d the exact coordinates of the stationary point on the curve with equation $y = 5xe^{\frac{1}{2}x}$ .	
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Find the gradient of the curve at the point $(\frac{1}{9}\pi, \frac{1}{6}\pi)$ .	[

4



The variables x and y satisfy the equation  $y = Ax^{-2p}$ , where A and p are constants. The graph of  $\ln y$  against  $\ln x$  is a straight line passing through the points (-0.68, 3.02) and (1.07, -1.53), as shown in the diagram.

Find the values of $A$ and $p$ .	[5]

		I	
5	(a)	Sketch, on the same diagram, the graphs of $y =  2x - 3 $ and $y = 3x + 5$ .	[2]

<b>(b)</b>	Solve the inequality $3x + 5 <  2x - 3 $ .	[3]
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6	The pol	ynomial	p(x)	is (	defined	by

$$p(x) = 6x^3 + ax^2 - 4x - 3,$$

where a is a constant. It is given that (x + 3) is a factor of p(x).

(a)	Find the value of <i>a</i> .	[2]
<b>(b)</b>	Using this value of $a$ , factorise $p(x)$ completely.	[3]
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)	Show that $a = \sqrt{2.5 - 0.5 \ln(2a + 1)}$ .	
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8	(a)	Show that $3 \sin 2\theta \cot \theta \equiv 6 \cos^2 \theta$ .	[2]
	(b)	Solve the equation $3 \sin 2\theta \cot \theta = 5$ for $0 < \theta < \pi$ .	[3]
			,

Find the exact value of $\int_{\frac{1}{4}\pi}^{\frac{1}{2}\pi} 3 \sin x \cot \frac{1}{2}x  dx$ .

## **Additional Page**

If you use the following lined page to complete the answer(s) to any question(s), the question number(s) must be clearly shown.					

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