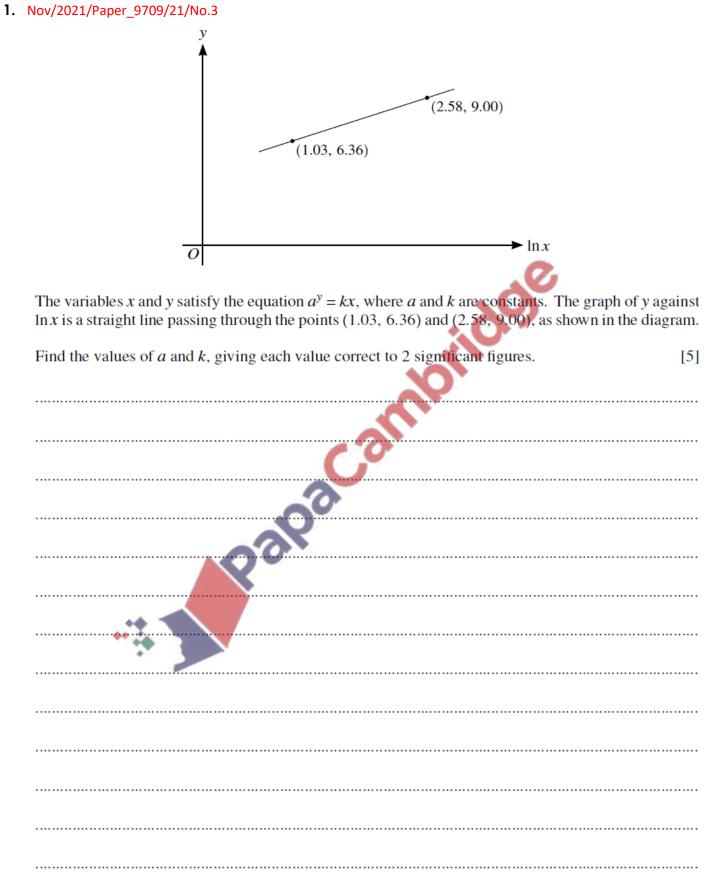
Logarithm and Exponential Functions – 2021 A2 Nov P2



2. Nov/2021/Paper_9709/22/No.6

(a) By sketching a suitable pair of graphs on the same diagram, show that the equation

 $\ln x = 2e^{-x}$

[2]

has exactly one root.

ambridge (b) Verify by calculation that the root lies between 1.5 and 1.6. [2]

(c) Show that if a sequence of values given by the iterative formula

$$x_{n+1} = e^{2e^{-x_n}}$$

	converges, then it converges to the root of the equation in part (a).	[1]
(d)	Use the iterative formula in part (c) to determine the root correct to 3 significant figures.	. Give
	the result of each iteration to 5 significant figures.	[3]
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