

Ln & e

Difficulty: Medium

Question Paper 1

Level	A Level
Subject	Maths Pure 3
Exam Board	CIE
Topic	Log & exponential functions
Sub-Topic	Ln & e
Difficulty	Medium
Booklet	Question Paper 1

Time allowed: 50 minutes

Score: /36

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E
>90%	81%	70%	58%	46%	34%

Question 1

Given that $x = 4(3^{-y})$, express y in terms of x . [3]

Question 2

Solve the equation $\ln(2 + e^{-x}) = 2$, giving your answer correct to 2 decimal places. [4]

Question 3

The polynomial $f(x)$ is defined by

$$f(x) = 12x^3 + 25x^2 - 4x - 12.$$

- (i) Show that $f(-2) = 0$ and factorise $f(x)$ completely. [4]

- (ii) Given that

$$12 \times 27^y + 25 \times 9^y - 4 \times 3^y - 12 = 0,$$

- state the value of 3^y and hence find y correct to 3 significant figures. [3]

Question 4

(i) Show that the equation

$$\log_2(x+5) = 5 - \log_2 x$$

can be written as a quadratic equation in x .

[3]

(ii) Hence solve the equation

$$\log_2(x+5) = 5 - \log_2 x.$$

[2]

Question 5

Showing all necessary working, solve the equation $3|2^x - 1| = 2^x$, giving your answers correct to 3 significant figures. [4]

Question 6

Showing all necessary working, solve the equation $5^{2x} = 5^x + 5$. Give your answer correct to 3 decimal places. [5]

Question 7

Find the set of values of x satisfying the inequality $|3^x - 8| < 0.5$, giving 3 significant figures in your answer. [4]

Question 8

Using the substitution $u = e^x$, or otherwise, solve the equation

$$e^x = 1 + 6e^{-x},$$

giving your answer correct to 3 significant figures.

[4]