

# Solving equations & inequalities

## Difficulty: Easy

### Question Paper 1

Level	A Level
Subject	Maths Pure 3
Exam Board	CIE
Topic	Log & exponential functions
Sub-Topic	Solving equations & inequalities
Difficulty	Easy
Booklet	Question Paper 1

**Time allowed:** 43 minutes

**Score:** /31

**Percentage:** /100

#### Grade Boundaries:

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

## Question 1

Using the substitution  $u = 3^x$ , solve the equation  $3^x + 3^{2x} = 3^{3x}$  giving your answer correct to 3 significant figures. [5]

## Question 2

Solve the equation  $\ln(x^2 + 4) = 2 \ln x + \ln 4$ , giving your answer in an exact form. [3]

### Question 3

Solve the equation  $\ln(1 + 2^x) = 2$ , giving your answer correct to 3 decimal places.

[3]

### Question 4

Using the substitution  $u = e^x$ , solve the equation  $4e^{-x} = 3e^x + 4$ . Give your answer correct to 3 significant figures.

[4]

## Question 5

(i) Show that if  $y = 2^x$ , then the equation

$$2^x - 2^{-x} = 1$$

can be written as a quadratic equation in  $y$ .

[2]

(ii) Hence solve the equation

$$2^x - 2^{-x} = 1.$$

[4]

## Question 6

Using the substitution  $u = 3^x$ , or otherwise, solve, correct to 3 significant figures, the equation

$$3^x = 2 + 3^{-x}.$$

[6]

## Question 7

Solve the equation

$$\ln(3x + 4) = 2 \ln(x + 1),$$

giving your answer correct to 3 significant figures.

[4]