Logarithmic and Exponential Functions
Question Paper 2

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Logarithmic and Exponential Functions
Sub Topic	
Booklet	Question Paper 2

Time Allowed: **56 minutes**

Score: **/46**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 The parametric equations of a curve are

$$x = 1 + \sqrt{t}, \quad y = 3\ln t.$$

   (i) Find the exact value of the gradient of the curve at the point *P* where $y = 6$.   [5]

   **(ii)** Show that the tangent to the curve at *P* passes through the point $(1, 0)$.   [3]

2 Solve the equation $\ln(3 - 2x) - 2\ln x = \ln 5.$ [5]

3 The variables *x* and *y* satisfy the equation $5^{y+1} = 2^{3x}$.

   (i) By taking logarithms, show that the graph of *y* against *x* is a straight line.   [2]

   (ii) Find the exact value of the gradient of this line and state the coordinates of the point at which the line cuts the *y*-axis.   [2]
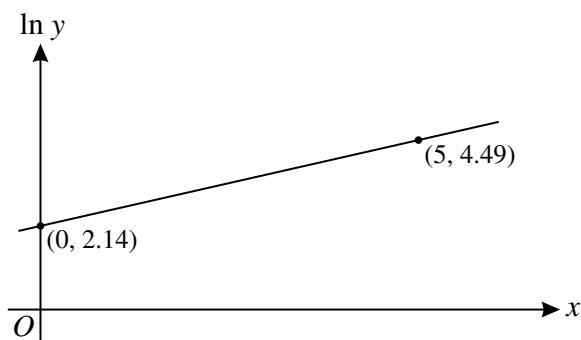
4 Use logarithms to solve the equation $5^x = 3^{2x-1}$, giving your answer correct to 3 significant figures.   [4]

5
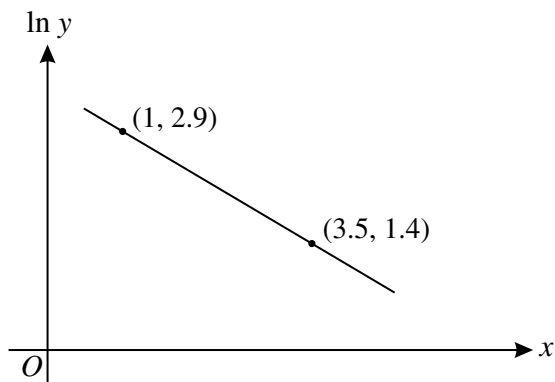
The variables x and y satisfy the equation $y = A(b^{-x})$, where A and b are constants. The graph of $\ln y$ against x is a straight line passing through the points $(1, 2.9)$ and $(3.5, 1.4)$, as shown in the diagram. Find the values of A and b, correct to 2 decimal places. [6]

6

The variables x and y satisfy the equation $y = A(b^x)$, where A and b are constants. The graph of $\ln y$ against x is a straight line passing through the points $(0, 2.14)$ and $(5, 4.49)$, as shown in the diagram. Find the values of A and b, correct to 1 decimal place. [5]

7 Solve the equation $3^{2x} - 7(3^x) + 10 = 0$, giving your answers correct to 3 significant figures. [5]

8   Use logarithms to solve the equation $4^{x+1} = 5^{2x-3}$, giving your answer correct to 3 significant figures.

[4]

9   Solve the equation $2\ln(x+3) - \ln x = \ln(2x-2)$.

[5]