3.1 Exponential & Logarithms

Question Paper

Course	Edexcel IAL Maths: Pure 3
Section	3. Logs & Exponentials
Topic	3.1 Exponential & Logarithms
Difficulty	Easy

Time allowed: **40**

Score: **/33**

Percentage: **/100**

Question 1

Write down the value of:

(i) 3^3

(ii) 4^{-2}

(iii) $9^{0.5}$

[3 marks]

Question 2

Sketch the graph with equation $y = a^x, a > 1$, stating the coordinates of the point where the graph intersects the y-axis and the equation of any asymptotes.
Also state whether this equation would represent exponential growth or decay.

[3 marks]

Question 3

The following equations can be used for exponential models.
State whether each one would represent exponential growth or exponential decay.

(i) $y = 3^{-2x}$

(ii) $y = 20(2)^x$

(iii) $y = 30a^{-x}$ where $a > 0$

[3 marks]

Question 4

Write down the value of a in the following statements:

(i) $3^a = 27$

(ii) $a^{\frac{1}{3}} = 5$

(iii) $4a^2 = 64$

[3 marks]

Question 5

Write down the value of a in the following statements:

(i) $\log_3 a = 4$

(ii) $\log_a 216 = 3$

(iii) $\log_2 128 = a$

[3 marks]

Question 6

Solve the equation

$$2^x = 16$$

[1 mark]

Question 7

(a) Solve the equation $x^2 - 12x + 27 = 0$.

[2 marks]

Question 7

(b) Hence, or otherwise, solve the equation $(3^x)^2 - 12(3^x) + 27 = 0$.

[3 marks]

Question 8

Solve the equation

$$2\log_3 9 = 5x - 6$$

[2 marks]

Question 9

Sketch the graph of $y = e^x$, clearly showing the coordinates of the point where the graph intercepts the y-axis and stating the equations of any asymptotes.

[3 marks]

Question 10

Given $y = e^{2x}$:

(i) Write down an expression for $\frac{dy}{dx}$.

(ii) Find the gradient of $y = e^{2x}$ at the point where $x = 0$.

[2 marks]

Question 11

Use a calculator to find the value of

(i) $5 \log_3 7$

(ii) $2 \log_2 3 + 3 \log_3 2$

giving your answers to four significant figures.

[2 marks]

Question 12

Solve the equation $e^{2x} - 16 = 0$, giving your answer in the form $a\ln a$ where a is an integer.

[3 marks]