1.2 Exponentials & Logs

Question Paper

Course	DP IB Maths
Section	1. Number & Algebra
Topic	1.2 Exponentials & Logs
Difficulty	Hard

Time allowed: 70

Score: /56

Percentage: /100

Question 1a

Let $f(x) = 5\ln(x - 7)$.

(a) Find the values of x for which $f(x)$ is undefined.

[2 marks]

Question 1b

(b) Given that point P has coordinates $(p, 0)$, find the value of p.

[3 marks]

Question 2a

(a) Given that $2^m = 8$ and $2^n = 16$, write down the value of m and of n.

[2 marks]

Question 2b

(b) Hence or otherwise solve $8^{2x+1} = 16^{2x-3}$.

[4 marks]

Question 3a

(a) Write the expression $3\ln 2 - \ln 4$ in the form $\ln k$, where $k \in \mathbb{Z}$.

[3 marks]

Question 3b

(b) Hence, or otherwise, solve $3\ln 2 - \ln 4 = -\ln x$.

[3 marks]

Question 4

Solve the equation $49^{p+4} = 35^{2p}$ for p. Express your answer in terms of $\ln 7$ and $\ln 5$.

[5 marks]

Question 5

Solve the equation $4^{x} - 3 \times 2^{x+2} = 64$.

[5 marks]

Question 6

It is given that $p = \log_{124} 125 \times \log_{123} 124 \times \log_{122} 123 \times \ldots \times \log_5 6$.
Given that $p \in \mathbb{Z}$, find the value of p.

[5 marks]

Question 7

Solve the equation $\log_6 3 + \log_6 2x = 2 - \log_6 12$.

[5 marks]

Question 8

Solve the equation $\log_9 x - \log_9 2 = 2 + \log_9 5$.

[5 marks]

Question 9a

(a) Find the value of $\log_4 32 + \log_4 8$.

[4 marks]

Question 9b

(b) Find the value of $64^{\log_4 3}$.

[4 marks]

Question 10

Find the integer values of x and y for which $x + y \log_9 5 + 12 \log_{27} 15 = 0$

[6 marks]