1.2 Exponentials & Logs

Question Paper

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

Time allowed: 80

Score: /59

Percentage: /100

Question 1a

Let $f(x) = \ln\left(\frac{x}{3} - 1\right)$.

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

[2 marks]

Question 1b

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

[3 marks]

Question 2

Solve $27^{4x+2} = 81^{8x-3}$.

[6 marks]

Question 3

Solve $5 \ln 2 - \ln 8 = -\ln x$.

[6 marks]

Question 4

Solve the equation $216^{k+2} = 12^{3k}$ for k. Express your answer in terms of $\ln 6$ and $\ln 2$.

[6 marks]

Question 5

Solve the equation $2 \times 25^{x} - 30 \times 5^{x-1} = 1$.

[5 marks]

Question 6

It is given that $p = \log_{242} 243 \times \log_{241} 242 \times \log_{240} 241 \times \ldots \times \log_{3} 4$.

Given that $p \in \mathbb{Z}$, find the value of p.

[5 marks]

Question 7

Solve the equation $\log_5 x - \log_5 4 = 4 + \log_5 2$.

[5 marks]

Question 8

Solve the equation $\log_4(2 - x) = \log_{16}(13 - 4x)$.

[7 marks]

Question 9a

(a) Find the value of $\log_8 2560 - \log_8 5$.

[4 marks]

Question 9b

(b) Find the value of $64^{\log_8 5}$.

[4 marks]

Question 10

Find the integer values of x and y for which $x + y\log_{343} 6 - 10\log_{49} 42 = 0$

[6 marks]