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

(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]**