

1.2 Exponentials & Logs

Question Paper

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

Time allowed: 90

Score: /69

Percentage: /100

Question la

Find the value of each of the following, giving your answer as an integer.

(a) ln *e*.

[2 marks]

Question 1b

(b) $\log_2 16$.

[2 marks]

Question 1c

(c) $\log 25 + \log 4$.

[2 marks]

Question 1d

(d) $\log_5 500 - \log_5 4$.

[2 marks]

Question 2a	
Let $x = \ln 15$ and $y = \ln 3$. Write down the following expressions in terms of x and y .	
(a) ln 5.	
	[2 marks]
Question 2b	
(b) ln 45.	
	[2 marks]

Question 2c

(c) ln 135.

[3 marks]



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Question 3a

Let $r = \log 2$ and $s = \log 12$. Write down the following expressions in terms of r and s .	
(a) log 24.	
	[2 marks]
Question 3b	
(b) log 3.	
	[3 marks]
Question 3c	
(c) log 72.	
	[3 marks]

Question 4a

Simplify the following:

(a)
$$\frac{(4xy^{-2})(-12x^{-4}y^{12})}{6x^2y}$$
.

[2 marks]

Question 4b

(b)
$$(2x^{-1}y^{-2})^{-3}(4x^2y^3)^4$$
.

[2 marks]

Question 4c

(c)
$$\sqrt[2]{(9x^6y^{-2}z^4)}^3 (3xyz)^{-2}$$
.

[2 marks]

Question 5

Solve the equation $2 - x\sqrt{3} = \frac{7x}{\sqrt{3}}$, giving your answer in the form $\frac{\sqrt{a}}{b}$ where a and b are integers. State the values of a and b.

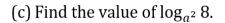
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	[5 marks]	
Question 6a		
Given that $\log_a 8 = 3$.		
(a) Find the value of $\log_a 64$.		
	[2 marks]	
Question 4h		
Question 6b		
(b) Find the value of a.		

Question 6b

Question 6a

[2 marks]

Question 6c



[3 marks]

Question 7a

Let $\log_b 3 = x$ and $\log_b 16 = y$

(a) Find an expression for $\log_b 9$ in terms of x.

[2 marks]

Question 7b

(b) Find an expression for $\log_b 4$ in terms of y.

[2 marks]

Question 7c

(c) Find an expression for $\log_b 48$ in terms of x and y.

[3 marks]

Question 8a

(a) Show that
$$\frac{(4-2\sqrt{x})^2}{8x}$$
 can be written as $2x^{-1} - 2x^{-\frac{1}{2}} + \frac{1}{2}$.

[2 marks]

Question 8b

(b) Given that $8\sqrt{2} = 2^a$, find the value of a.

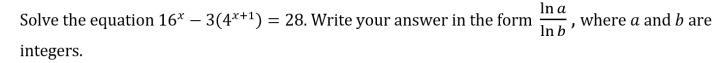
[2 marks]

Question 8c

(c) Show that $\frac{x(2x^4-\sqrt{x})}{x^2}$ can be written as $2x^a-x^b$, where a and b are rational numbers. State the value of a and b.

[2 marks]

Question 9



[5 marks]

Question 10

 $\sqrt{425}$ can be written in the form $a\sqrt{b}$. Find the values of a and b. Show all of your working.

[5 marks]

Question 11

Solve the equation $4^x - 3 \times 2^{x+1} = (-2)^3$.

[5 marks]