IB Maths: AA HL

Exponentials & Logs

Topic Questions

These practice questions can be used by students and teachers and is Suitable for IB Maths AA HL Topic Questions

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

Level: IB Maths

Subject: IB Maths AA HL

Board: IB Maths

Topic: Exponentials & Logs

Question 1

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

(a) In e.

[2 marks]

(b) $log_2 \, 16$.

[2 marks]

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

[2 marks]

(d) $log_5 \, 500 - log_4 4$.

[2 marks]

Question 2

Let $x = In \, 15$ and $y = In \, 3$. Write down the following expressions in terms of x and y.

(a) In 5.

[2 marks]

(b) In 45.

[2 marks]

(c) ln 135.

[3 marks]

Question 3

Let $r = log2$ and $s = log12$. Write down the following expressions in terms of r and s.

(a) $log24$.

[2 marks]

(b) log3.

[3 marks]

(c) log 72.

[3 marks]

Question 4

Simplify the following:

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

[2 marks]

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

[2 marks]

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

[2 marks]

Question 5

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

State the values of a and b.

[5 marks]

Question 6

Give that $\log_a 8 = 3.$

(a) Find the value of $\log_a 64.$

[2 marks]

(b) Find the value of a .

[2 marks]

(c) Find the value of $\log_{a^2} 8.$

[3 marks]

Question 7

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

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

[2 marks]

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

[2 marks]

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

[3 marks]

Question 8

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

[2 marks]

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

[2 marks]

(c) Show that $\dfrac{x(2x^4 - \sqrt{x})}{x^2}$ 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

Solve the equation $16^x - 3(4^{x+1}) = 28$. Write your answer in the form $\frac{\ln a}{\ln b}$, where a and b are integers.

[5 marks]

Question 10

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

[5 marks]