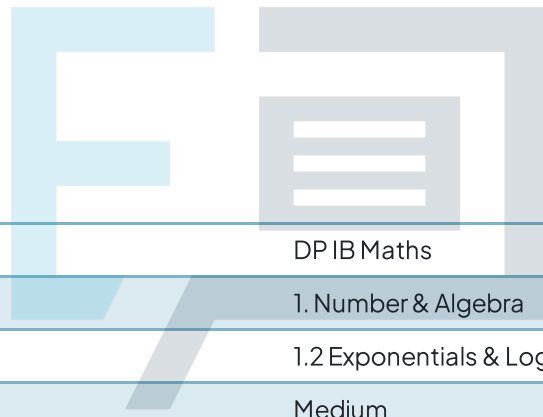




# 1.2 Exponentials & Logs

## Question Paper



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

# Exam Papers Practice

To be used by all students preparing for DP IB Maths AA SL  
Students of other boards may also find this useful

**Question 1a**

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

$\ln e$ .

[2 marks]

**Question 1b**

$\log_2 16$ .

[2 marks]

**Question 1c**

$\log 25 + \log 4$ .

[2 marks]



Exam Papers Practice

**Question 1d**

$\log_5 500 - \log_5 4$ .

[2 marks]

**Question 2a**

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

$\ln 5$ .

[2 marks]

**Question 2b**

$\ln 45$ .

[2 marks]

**Question 2c**

$\ln 135$ .

[3 marks]



Exam Papers Practice

**Question 3a**

Let  $r = \log 2$  and  $s = \log 12$ . Write down the following expressions in terms of  $r$  and  $s$ .

$\log 24$ .

[2 marks]

**Question 3b**

$\log 3$

[3 marks]

**Question 3c**

$\log 72$ .

[3 marks]



# Exam Papers Practice

**Question 4a**

Simplify the following:

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

[2 marks]

**Question 4b**

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

[2 marks]

**Question 4c**

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

[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  $b$ .

[5 marks]

Exam Papers Practice

**Question 6a**

Given that  $\log_a 8 = 3$ .

Find the value of  $\log_a 64$ .

[2 marks]

**Question 6b**

Find the value of  $a$ .

[2 marks]

**Question 6c**

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

[3 marks]



Exam Papers Practice

**Question 7a**

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

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

[2 marks]

**Question 7b**

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

[2 marks]

**Question 7c**

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

[3 marks]



# Exam Papers Practice

**Question 8a**

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**

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

[2 marks]

**Question 8c**

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**

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]



# Exam Papers Practice

**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]



Exam Papers Practice