Instructions

Solve the following problems using the properties of logarithmic functions. Show all steps clearly, and simplify your answers as much as possible.

Problems

Problem 1

Simplify the expression using logarithmic properties:

$$\log_5(25) + \log_5(5)$$

Problem 2

Solve for x using the properties of logarithms:

$$\log_2(x) + \log_2(8) = 4$$

Problem 3

Express as a single logarithm:

$$\log_3(81) - \log_3(9)$$

Problem 4

Use the change of base formula to evaluate the logarithm:

$$\log_4(16)$$

Problem 5

Simplify the expression:

$$\frac{1}{3}\log_2(8) + \frac{1}{2}\log_2(4)$$

Problem 6

Solve for y in the equation:

$$\log_{10}(y) = \log_{10}(5) + \log_{10}(2)$$

Problem 7

Express the logarithmic expression as a sum or difference of logarithms:

$$\log_b\left(\frac{x^2 \cdot y^3}{z}\right)$$

Problem 8

Use the properties of logarithms to simplify:

$$\log_7(7^4) - 2\log_7(7)$$

Problem 9

Solve the logarithmic equation for x:

$$2\log_3(x) = \log_3(9)$$

Problem 10

Express the following logarithmic expression using the change of base formula:

$$\log_5(50)$$