

Simplifying and Solving Logarithms

Simplify each expression, then solve. Place the letter of the correct answer above the problem number below.

Example 1: $\log_3 x - \log_3 4 = \log_3 12$

$$\log_3 \left(\frac{x}{4} \right) = \log_3 (12)$$

$$\text{therefore } \frac{x}{4} = 12$$

$$x = 48$$

Example 2: $\log_5 7 + \frac{1}{2} \log_5 4 = \log_5 x$

$$\log_5 7 + \log_5 4^{\frac{1}{2}} = \log_5 x$$

$$\log_5 7 + \log_5 2 = \log_5 x$$

$$\log_5 14 = \log_5 x$$

$$x = 14$$

1. $\log_3 x - 2 \log_3 2 = 3 \log_3 3$

M. 23

N. 108

O. 6^3

2. $\log_2 x = 9$

A. 18

E. 512

I. 81

3. $\log_2 128 = x$

C. 16

D. 64

E. 7

4. $\log_x 144 = 2$

N. 12

O. 72

P. $\frac{1}{12}$

5. $\log_2 x = \frac{1}{3} \log_2 27$

N. 3

O. 9

P. 27

6. $\log_{16} 32 - \log_{16} 2 = x$

W. 2

X. 1

Y. 16

7. $5 \log 2 = \log x$

E. 10

I. 16

O. 32

8. $\log_2 x - \log_2 5 = \log_2 10$

R. 25

S. 15

T. 50

A logarithm is an $\frac{\quad}{2} \frac{\quad}{6} \frac{\quad}{4} \frac{\quad}{7} \frac{\quad}{5} \frac{\quad}{3} \frac{\quad}{1} \frac{\quad}{8}$.