



Practice

6.4 Properties of Logarithmic Functions

Write each expression as a sum or a difference of logarithms. Then simplify, if possible.

1. $\log_{10}(4 \cdot 100)$

2. $\log_5 \frac{72}{25}$

3. $\log_7(5 \cdot 3 \cdot 4)$

4. $\log_3 15q$

5. $\log_8 \frac{64}{y}$

6. $\log_9 \frac{3a}{7}$

Write each expression as a single logarithm. Then simplify, if possible.

7. $\log_3 5 + \log_3 6$

8. $\log_5 x - \log_5 2$

9. $\log_8 2 + \log_8 32$

10. $\log_9 5 + \log_9 y - \log_9 4$

11. $2 \log_{12} 6 + \log_{12} 4$

12. $\frac{1}{2} \log_3 81 + \log_3 15$

13. $\log_b m + \log_b 2 - \log_b x$

14. $3 \log_b x - (\log_b 4 + \log_b x)$

15. $3 \log_b z + \log_b y - 4 \log_b z$

Evaluate each expression.

16. $5^{\log_5 12}$ _____

17. $12^{\log_{12} 73}$ _____

18. $\log_3 3^{2.5}$ _____

19. $\log_2 2^{4.7}$ _____

20. $\log_4 4^3 - \log_3 81$ _____

21. $9^{\log_9 15} - \log_3 3^5$ _____

Solve for x and check your answers.

22. $\log_2(10x) = \log_2(3x + 14)$ _____

23. $2 \log_3 x = \log_3 4$ _____

24. $\log_5(4x - 3) = \log_5(x + 1)$ _____

25. $\log_7(x^2 - 1) = \log_7 8$ _____

26. $\log_8(x^2 - 3x) = \log_8(2x + 6)$ _____

27. $2 \log_2(x + 2) = \log_2(3x + 16)$ _____

28. $\log_b 8 = \log_b x + \log_b(x - 2)$ _____

29. $2 \log_b(x + 1) = \log_b(-x + 11)$ _____