

7-4

Practice

Form G

Properties of Logarithms

Write each expression as a single logarithm.

1. $\log_5 4 + \log_5 3$

2. $\log_6 25 - \log_6 5$

3. $\log_2 4 + \log_2 2 - \log_2 8$

4. $5 \log_7 x = 2 \log_7 x$

5. $\log_4 60 - \log_4 4 + \log_4 x$

6. $\log 7 - \log 3 + \log 6$

7. $2 \log x - 3 \log y$

8. $\frac{1}{2} \log r + \frac{1}{3} \log s - \frac{1}{4} \log t$

9. $\log_3 4x + 2 \log_3 5y$

13. $(\log 3 - \log 4) - \log 2$

14. $5 \log x + 3 \log x^2$

15. $\log_6 3 - \log_6 6$

Expand each logarithm. Simplify if possible.

22. $\log xyz$

23. $\log_2 \frac{x}{yz}$

24. $\log 6x^3y$

25. $\log 7(3x - 2)^2$

26. $\log \sqrt{\frac{2rst}{5w}}$

27. $\log \frac{5x}{4y}$

28. $\log_5 5x^{-5}$

29. $\log \frac{2x^2y}{3k^3}$

30. $\log_4 (3xyz)^2$

Use the Change of Base Formula to evaluate each expression. Round your answer to the nearest thousandth.

31. $\log_4 32$

32. $\log_3 5$

33. $\log_2 15$

34. $\log_6 17$

39. The concentration of hydrogen ions in a batch of homemade ketchup is 10^{-4} . What is the pH level of the ketchup?Determine if each statement is *true* or *false*. Justify your answer.

40. $\log 12 = \log 4 + \log 3$

41. $\log \frac{3}{5} = \frac{\log 3}{\log 5}$