

Section 7.4-7.5 Practice

For #1-6, suppose $\log_b 3 = p$ and $\log_b 5 = q$. Express each quantity in terms of p and q .

1. $\log_b 25$

2. $\log_b \sqrt{3}$

3. $\log_b \frac{1}{15}$

4. $\log_b 45$

5. $\log_b \frac{5}{b}$

6. $\log_b 3b^2$

For #7-12, expand or condense each logarithmic expression.

7. $7\log_4 2 + 5\log_4 x + 3\log_4 y$

8. $\log_3 12^{\frac{5}{6}} x^9$

9. $\log_8 \sqrt[4]{x^3}$

10. $\log_6 \left(\frac{x^4 y^{-2}}{x^2 y^6} \right)^3$

11. $\frac{1}{4}\log_5 81 - \left(2\log_5 6 - \frac{1}{2}\log_5 4 \right)$

12. $3(\log_2 3 - \log_2 x) + (\log_2 x - \log_2 9)$

For #13-18, solve each equation or inequality.

13. $3\log_5(x^2 + 9) - 6 = 0$

14. $\log_2(3x - 5) \geq \log_2(x + 7)$

15. $\log_3(4x + 3) = \log_3(3x - 4)$

16. $\log_3(2x - 1) \leq 2$

17. $\log_{16}(9x + 5) - \log_{16}(x^2 - 1) = \frac{1}{2}$

18. $\log_7 x + 2\log_7 x - \log_7 3 = \log_7 72$

Challenge: Suppose you know that $\log_{10} 2 = 0.301$ and you want to construct a table of approximate logarithms of the integers between 1 and 9. Find $\log_{10} 4$, $\log_{10} 5$ and $\log_{10} 8$ directly from the value of $\log_{10} 2$.