

Homework p. 510: 3-9, 15-21 (odds), 28, 33-39 (odds), 45, 47

MATCHING EXPRESSIONS Match the expression with the logarithm that has the same value.

3. $\ln 6 - \ln 2$

4. $2 \ln 6$

5. $6 \ln 2$

6. $\ln 6 + \ln 2$

A. $\ln 64$

B. $\ln 3$

C. $\ln 12$

D. $\ln 36$

APPROXIMATING EXPRESSIONS Use $\log 4 \approx 0.602$ and $\log 12 \approx 1.079$ to evaluate the logarithm.

7. $\log 3$

8. $\log 48$

9. $\log 16$

EXPANDING EXPRESSIONS Expand the expression.

15. $\log_3 4x$ **17.** $\log 3x^4$ 19. $\log_2 \frac{2}{5}$ 21. $\log_4 \frac{x}{3y}$ 28. $\ln \frac{6x^2}{y^4}$

CONDENSING EXPRESSIONS Condense the expression.

33. $\log_4 7 - \log_4 10$

35. $2 \log x + \log 11$

37. $5 \log x - 4 \log y$

39. $\ln 40 + 2 \ln \frac{1}{2} + \ln x$

CHANGE-OF-BASE FORMULA Use the change-of-base formula to evaluate the logarithm.

45. $\log_4 7$

47. $\log_3 15$