7.5 EXERCISES

HOMEWORK KEY

= **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 11, 17, and 71

= **TAKS PRACTICE AND REASONING** Exs. 43, 44, 64, 71, 73, 75, and 76

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: To condense the expression $\log_3 2x + \log_3 y$, you need to use the ___?___ property of logarithms.

2. **WRITING** *Describe* two ways to evaluate $\log_7 12$ using a calculator.

EXAMPLE 1 on p. 507 for Exs. 3–14

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. $\log 16$
10. $\log 64$
11. $\log 144$
12. $\log \frac{1}{3}$
13. $\log \frac{1}{4}$
14. $\log \frac{1}{12}$

EXAMPLE 2 on p. 508 for Exs. 15–32

EXPANDING EXPRESSIONS **Expand the expression.**

15. $\log_3 4x$
16. $\ln 15x$
17. $\log 3x^4$
18. $\log_5 x^5$
19. $\log_2 \frac{2}{5}$
20. $\ln \frac{12}{5}$
21. $\log_4 \frac{x}{3y}$
22. $\ln 4x^2y$
23. $\log_7 5x^3yz^2$
24. $\log_6 36x^2$
25. $\ln x^2y^{1/3}$
26. $\log 10x^3$
27. $\log_2 \sqrt{x}$
28. $\ln \frac{6x^2}{y^4}$
29. $\ln \sqrt[4]{x^3}$
30. $\log_3 \sqrt{9x}$

ERROR ANALYSIS ***Describe*** **and correct the error in expanding the logarithmic expression.**

31. $\log_2 5x = (\log_2 5)(\log_2 x)$ ✗

32. $\ln 8x^3 = 3 \ln 8 + \ln x$ ✗

EXAMPLE 3 on p. 508 for Exs. 33–43

CONDENSING EXPRESSIONS **Condense the expression.**

33. $\log_4 7 - \log_4 10$
34. $\ln 12 - \ln 4$
35. $2 \log x + \log 11$
36. $6 \ln x + 4 \ln y$
37. $5 \log x - 4 \log y$
38. $5 \log_4 2 + 7 \log_4 x + 4 \log_4 y$
39. $\ln 40 + 2 \ln \frac{1}{2} + \ln x$
40. $\log_5 4 + \frac{1}{3} \log_5 x$
41. $6 \ln 2 - 4 \ln y$
42. $2(\log_3 20 - \log_3 4) + 0.5 \log_3 4$

43. **MULTIPLE REASONING** Which of the following is equivalent to $3 \log_4 6$?

A $\log_4 18$ **B** $\log_4 72$ **C** $\log_4 216$ **D** $\log_4 256$