Unit 4 Extra Review: Logarithms

Solve each equation.

1. $8^{2x-3} = 32$
2. $\left(\frac{1}{8}\right)^{x-1} = 128$
3. $9^x = 27^{x-2}$
4. $15^{2x-1} = 225$
5. $e^{x-5} = 17$
6. $3^{-x} = 28$
7. $2\left(5^x\right) = 32$
8. $\log_{10} x - 2 = 0$
9. $6^x + 10 = 46$
10. $\log(5x) = 2$
11. $\log_3(5x-1) = \log_3(x+7)$
12. $\log(5x) + \log(x-1) = 2$
13. $2\log x - \log 16 = \log 4$
14. $\log(x-1) + \log(x+1) = 1$

Simplify the expression.

15. $2\log_4 4$
16. $\ln e^4$
17. $\log_5 \frac{1}{125}$
18. $\ln \frac{1}{\sqrt{e}}$
19. $\log_5 75 - \log_5 3$
20. $\log_4 64$
21. $7^{\log_7 15}$
22. $e^{\ln 2}$
23. $\log_4 2 + \log_4 32$

Simplify.

24. Expand using properties of logs
    a. $\log_6 4x^2 y$
    b. $\log_2 \dfrac{xy^2 z}{w^3}$
    c. $\log \dfrac{(2x)^3 (5y)}{\sqrt{z}}$
25. Condense using properties of logs
    a. $\dfrac{1}{2}(\log_3 x + 2\log_3 y) - 3\log_3 z$
    b. $2(\log x + 3\log z) - (2\log y + \log w)$
    c. $2[\ln 2 + \ln x] - \dfrac{1}{3}\ln(x-1)$

Solve.

26. Mr. and Mrs. Sawyer bought a condominium for $75,000. Assuming that its value will appreciate at 6% a year, how much will the condo be worth in five years if it is compounded
    a. Yearly?
    b. Monthly?
    c. Bi-yearly? (Semi-annually)
    d. Continuously?