Do all of your work on a separate sheet of paper.

Graph the function. State the domain and range. (Section 7.1)

1. $y=\left(\dfrac{3}{5}\right)^{x}$

2. $y=-2\cdot 2^{x}$

3. $y=(0.8)^{x-3}-2$

4. $y=\dfrac{1}{4}\cdot 3^{x+1}+2$

Evaluate the logarithm **without** using a calculator. (Section 7.4)

5. $\log_{4}\left(\dfrac{1}{16}\right)$

6. $\log_{6}6$

7. $\log_{5}125$

8. $\log_{\frac{3}{4}}\left(\dfrac{64}{27}\right)$

Simplify the expression. (Section 7.4)

9. $5^{\log_{5}x}$

10. $10^{\log 9}$

11. $\log_{4}16^{x}$

12. $e^{\ln 5}$

Expand the expression. (Section 7.5)

13. $\log_{5}\left(\dfrac{2x}{5}\right)$

14. $\log\left(\dfrac{100x^{2}}{y}\right)$

15. $\ln 20x^{3}y^{2}$

16. $\log_{2}\sqrt[3]{8x^{4}}$

Condense the expression. (Section 7.5)

17. $\log_{4}20+4\log_{4}x$

18. $\log 7+2\log x-5\log y$

19. $0.5\ln 100-2\ln x+8\ln y$

Use the change of base formula to evaluate the logarithm. (Section 7.5)

20. $\log_2 5$

21. $\log_4 80$

22. $\log_5 100$

23. $\log_7 27$

Solve the equation. Check for extraneous solutions. (Section 7.6)

24. $2^{4x+2} = 8^{x+2}$

25. $\left(\dfrac{1}{9}\right)^{x-3} = 3^{3x+1}$

26. $7^{9x} = 18$

27. $\ln(3x+7) = \ln(x-1)$

28. $\log_5(3x+2) = 3$

29. $\log_6(x+9) + \log_6 x = 2$

30. You want to have $3000 in your savings account after 3 years. Find the amount you should deposit for each of the situations described below.
    a. The account pays 2.25% annual interest compounded quarterly.
    b. The account pays 3.5% annual interest compounded monthly.
    c. The account pays 4% annual interest compounded yearly.

31. In 2000, the average price of a football ticket for a Minnesota Vikings game was $48.28. During the next 4 years, the price increased an average of 6% each year.
    a. Write a model giving the average price p (in dollars) of a ticket t years after 2000.
    b. Graph the model. Estimate the year when the average ticket price was about $60.

32. You buy a new stereo for $1300 and are able to sell it 4 years later for $275. Assume that the resale value of the stereo decays exponentially with time. Write an equation giving the stereo's resale value V (in dollars) as a function of time t (in years) since you bought it.

33. You deposit $2000 in an account that pays 4% annual interest compounded continuously. What is the balance after 5 years?

34. You deposit $800 in an account that pays 2.65% annual interest compounded continuously. What is the balance after 12.5 years?