

EXAMPLE 3on p. 500
for Exs. 20–27**CALCULATING LOGARITHMS** Use a calculator to evaluate the logarithm.

20. $\log 14$ 21. $\ln 6$ 22. $\ln 0.43$ 23. $\log 6.213$
 24. $\log 27$ 25. $\ln 5.38$ 26. $\log 0.746$ 27. $\ln 110$

EXAMPLE 5on p. 501
for Exs. 28–36**USING INVERSE PROPERTIES** Simplify the expression.

28. $7^{\log_7 x}$ 29. $\log_5 5^x$ 30. $30^{\log_{30} 4}$ 31. $10^{\log 8}$
 32. $\log_6 36^x$ 33. $\log_3 81^x$ 34. $\log_5 125^x$ 35. $\log_2 32^x$
 36. **★ TAKS PRACTICE AND REASONING** Which expression is equivalent to $\log 100^x$?
 (A) x (B) $2x$ (C) $10x$ (D) $100x$

EXAMPLE 6on p. 501
for Exs. 37–44**FINDING INVERSES** Find the inverse of the function.

37. $y = \log_8 x$ 38. $y = 7^x$ 39. $y = (0.4)^x$ 40. $y = \log_{1/2} x$
 41. $y = e^{x+2}$ 42. $y = 2^x - 3$ 43. $y = \ln(x + 1)$ 44. $y = 6 + \log x$

EXAMPLES 7 and 8on pp. 502–503
for Exs. 45–53**GRAPHING FUNCTIONS** Graph the function. State the domain and range.

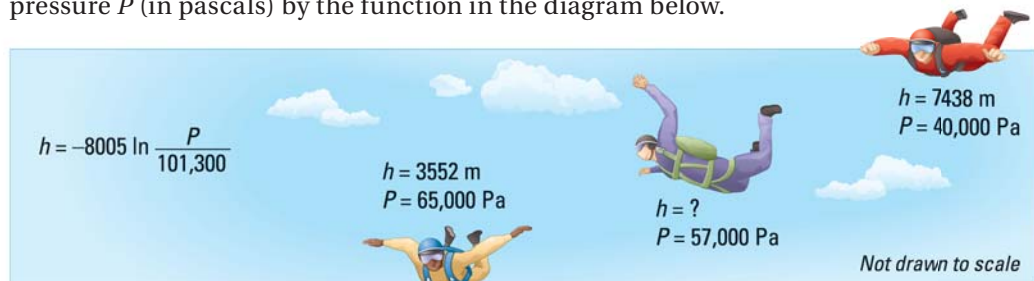
45. $y = \log_4 x$ 46. $y = \log_6 x$ 47. $y = \log_{1/3} x$
 48. $y = \log_{1/5} x$ 49. $y = \log_2(x - 3)$ 50. $y = \log_3 x + 4$
 51. $f(x) = \log_4(x + 2) - 1$ 52. $g(x) = \log_6(x - 4) + 2$ 53. $h(x) = \log_5(x + 1) - 3$

CHALLENGE Evaluate the logarithm. (*Hint: For each logarithm $\log_b x$, rewrite b and x as powers of the same number.*)

54. $\log_{27} 9$ 55. $\log_8 32$ 56. $\log_{125} 625$ 57. $\log_4 128$

PROBLEM SOLVING**EXAMPLE 4**on p. 500
for Exs. 58–59

58. **ALTIMETER** Skydivers use an instrument called an altimeter to track their altitude as they fall. The altimeter determines altitude by measuring air pressure. The altitude h (in meters) above sea level is related to the air pressure P (in pascals) by the function in the diagram below.



What is the altitude above sea level when the air pressure is 57,000 pascals?

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59. **CHEMISTRY** The pH value for a substance measures how acidic or alkaline the substance is. It is given by the formula $\text{pH} = -\log [\text{H}^+]$ where H^+ is the hydrogen ion concentration (in moles per liter). Lemon juice has a hydrogen ion concentration of $10^{-2.3}$ moles per liter. What is its pH value?

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