

Number:

Textbook Section:

Title:

1. Write each logarithmic equation as an exponential equation.

a) $\log_3 81 = 4$

b) $\log_{1/2} 32 = -5$

2. Write each exponential equation as a logarithmic equation.

a) $2^4 = 16$

b) $10^3 = 1000$

c) $w^{x+2} = r$

For #3-8, solve each equation.

3. $\log_4(x) = \frac{1}{3}$

4. $5^{3-x} = 12$

5. $\log_3(2x) = \log_3(24 - x^2)$

6. $\log_4(8x + 10) = 3$

7. $\log(2x + 3) = 1$

8. $\ln e^{2x} = 8$

9. The formula $D = 5e^{-0.4h}$ can be used to find the number of milligrams D of a certain drug in a patient's bloodstream h hours after being administered. When the number of milligrams reaches 2, the patient gets another dose. What is the time between injections?

10. According to the CIA *World Factbook*, the population of the world in 2014 was about 7,175 million and growing at a rate of 1.064% per year. At this growth rate, $P(t) = 7175(1.01064)^{t-2014}$ represents the population (in millions) in year t . According to this model, when will the population be 12 billion?

11. If \$8000 is deposited into an account that earns 4% interest compounded quarterly, how long will it be before it is worth \$10,000?

How long will it take to double?

How long would it take to double if the interest is compounded continuously?

12. The half-life of uranium-235 is 703,800,000 years. Use this to find the rate of decay of U-235.