

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

- 1) Suppose the amount of a radioactive element remaining in a sample of 100 milligrams after x years can be described by $A(x) = 100e^{-0.01885x}$. How much is remaining after 211 years? Round the answer to the nearest hundredth of a milligram. 1) _____

Decide whether the function is an exponential growth or exponential decay function and find the constant percentage rate of growth or decay.

- 2) $f(x) = 20,138 \cdot 0.811^x$ (2.5) $f(x) = 7 \cdot 1.048^x$ 2) _____

Find the exponential function that satisfies the given conditions.

- 3) Initial value = 63, decreasing at a rate of 0.43% per week 3) _____

Determine a formula for the exponential function.

- 4) 4) _____

x	$f(x)$
-2	33
-1	23.1
0	16.17
1	11.319
2	7.9233

Solve the problem.

- 5) The number of students infected with the flu on a college campus after t days is modeled by the function $P(t) = \frac{440}{1 + 39e^{-0.3t}}$. What was the initial number of infected students? 5) _____

- 6) The population of wolves in a state park after t years is modeled by the function $P(t) = \frac{1100}{1 + 99e^{-0.3t}}$. What is the maximum number of wolves possible in the park? 6) _____

Solve the equation by changing it to logarithmic form.

- 7) $e^{-x} = \frac{1}{18}$ 7) _____

Rewrite the expression as a sum or difference or multiple of logarithms.

- 8) $\log_4 \left(\frac{x^{1/2}}{y^6} \right)$ 8) _____

Use the product, quotient, and power rules of logarithms to rewrite the expression as a single logarithm. Assume that all variables represent positive real numbers.

- 9) $4 \log_m x - 7 \log_m (x+5)$ 9) _____

Use the appropriate interest formula to find the amount that will be in an account, given the stated conditions.

- 10) $P = \$200$, $t = 6$, $r = 9\%$ compounded continuously 10) _____

Solve the problem.

- 11) Find the future value accumulated in an annuity after investing periodic payments of \$300 for 10 years at an annual interest rate of 5%, with payments made and credited 4 times per year. 11) _____

Determine the doubling time of the investment.

- 12) \$1900 at 9% compounded quarterly 12) _____

Solve the problem.

- 13) Suppose you contribute \$60 per month into a fund that earns 7.5% annual interest. What is the value of your investment after 30 years? 13) _____

- 14) Find the future value accumulated in an annuity after investing periodic payments of \$50 for 19 years at an annual interest rate of 8%, with payments made and credited 12 times per year. 14) _____

- 15) Find the present value of a loan with an annual interest rate of 7.5% and periodic payments of \$232.11 for a term of 3 years, with payments made and interest charged 12 times per year. 15) _____

Use the appropriate interest formula to find the amount that will be in an account, given the stated conditions.

- 16) $P = \$14,000, t = 3, r = 12\%, n = 2$ 16) _____

Solve the equation.

- 17) $\log_3(x - 4) + \log_3(x - 4) = 2$ 17) _____

Solve the equation. If necessary, round to thousandths.

- 18) $5(4x - 2) = 24$ 18) _____

Solve the equation algebraically.

- 19) $3 - \log_2(x + 6) = 2$ 19) _____

Use the product, quotient, and power rules of logarithms to rewrite the expression as a single logarithm. Assume that all variables represent positive real numbers.

- 20) $4 \log_5(4x + 1) + 5 \log_5(2x + 6)$ 20) _____

Rewrite the expression as a sum or difference or multiple of logarithms.

- 21) $\log_9\left(\frac{\sqrt[7]{20}}{s^2r}\right)$ 21) _____