

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

Use a calculator and the base-change formula to find the logarithm to four decimal places.

1) $\log_9(89.44)$ 1) _____

2) $\log_7(0.748)$ 2) _____

Solve the exponential equation, find an exact solution and a decimal approximation.

3) $6^{x+4} = 4^x$ 3) _____

4) $e^{-x} = 5^{2x}$ 4) _____

5) $200 - (1.77)^x = 0$ 5) _____

6) $e^x + e^{-x} = 6$ 6) _____

Solve the logarithmic equation, find an exact solution and a decimal approximation.

7) $3\ln(x + 2.8) = 4.8$ 7) _____

8) $\log_6 x + \log_6(x - 3) = 2$ 8) _____

9) $\log_4(2x + 5) - \log_4(x - 2) = 1$ 9) _____

Solve the problem.

10) How long will it take a sample of radioactive substance to decay to half of its original amount, if it decays according to the function $A(t) = 200e^{-0.216t}$, where t is the time in years? Round to the nearest hundredth year. 10) _____

Solve.

11) The population of a particular city is increasing at a rate proportional to its size. It follows the function $P(t) = 1 + ke^{0.03t}$ where k is a constant and t is the time in years. If the current population is 15,000, in how many years is the population expected to be 37,500? (Round to the nearest year.) 11) _____