Practice the following problems related to exponential growth models.

Section 2.4.

10. Compound interest. If an amount P_0 is deposited in a savings account and interest is compounded continuously at 4.3% per year, the balance P grows at the rate given by

$$\frac{dP}{dt} = 0.043P.$$

a) Find the function that satisfies the equation. Write it in terms of P_0 and 0.043.
b) Suppose $20,000 is deposited. What is the balance after 1 yr? After 2 yr?
c) What is the rate of change of the balance after 1 yr? After 2 yr?

16. Consumer price index. The *consumer price index* compares the costs, c, of goods and services over various years, where 1983 is used as a base ($t = 0$). The same goods and services that cost $100 in 1983 cost $243 in 2017. (*Source:* Bureau of Labor Statistics.)

a) Model c as an exponential function, rounding the growth rate k to six decimal places. Let t be the number of years after 1983.
b) Estimate what the goods and services costing $100 in 1983 will cost in 2023.
c) Estimate the rate of change in 2023 of the cost of goods and services that cost $100 in 1983.

22. Average salary of Major League baseball players. In 1970, the average salary of Major League baseball players was $29,303. In 2016, the average salary was $4,400,000. (*Source:* mlb.com.) Assuming exponential growth occurred, what was the growth rate to the nearest hundredth of a percent? What will the average salary be in 2025? Round your answer to the nearest thousand dollars.