

Practice

The Number e

- 1. Demographics** In 1995, the population of Kalamazoo, Michigan, was 79,089. This figure represented a 0.4% annual decline from 1990.
 - a. Let t be the number of years since 1995 and write a function that models the population in Kalamazoo in 1995.
 - b. Predict the population in 2010 and 2015. Assume a steady rate of decline.
- 2. Biology** Suppose a certain type of bacteria reproduces according to the model $P(t) = 100e^{0.271t}$, where t is time in hours.
 - a. At what rate does this type of bacteria reproduce?
 - b. What was the initial number of bacteria?
 - c. Find the number of bacteria at $P(5)$, $P(10)$, $P(24)$, and $P(72)$. Round to the nearest whole number.
- 3. Finance** Suppose Karyn deposits \$1500 in a savings account that earns 6.75% interest compounded continuously. She plans to withdraw the money in 6 years to make a \$2500 down payment on a car. Will there be enough funds in Karyn's account in 6 years to meet her goal?
- 4. Banking** Given the original principal, the annual interest rate, the amount of time for each investment, and the type of compounded interest, find the amount at the end of the investment.
 - a. $P = \$1250$, $r = 8.5\%$, $t = 3$ years, semiannually
 - b. $P = \$2575$, $r = 6.25\%$, $t = 5$ years 3 months, continuously