

Lesson 7.6 Extra Practice

STUDENT BOOK PAGES 425–432

- a) For each of the following exponential models, identify the initial amount, the growth rate, and the number of growth periods.

 - $A(t) = 45(1.23)^{11}$
 - $N(t) = 1000(1.10)^4$
 - $P(t) = 23(1.025)^{30}$
 - $M(t) = 50(2)^8$

b) Use a calculator to evaluate the equations in part (a) to three decimal places.
- A bank pays 5% interest yearly on deposits. Suppose an account is opened at this bank with \$1500 in it.

 - Write a function $A(t)$ that tells how much money is in the account after t years.
 - How much money is in the account after 9 years?
 - What does $A(5.5)$ represent? Does this point make sense? Why or why not?
 - What does $A(-3)$ represent? Does this point make sense? Why or why not?
- The population of a town can be modelled by the equation $P(t) = 20(1.019)^t$, where $P(t)$ is the population in thousands and t is in years, where $t =$ corresponds to the year 2000.

 - What is the initial population of the town?
 - What is the annual growth rate of the town?
 - What is the population in the year 2015?
 - What does $P(5.5)$ represent? Does this point make sense? Why or why not?
 - What does $P(-3)$ represent? Does this point make sense? Why or why not?
- Six hundred yeast cells in a bowl double in number every hour.

 - Write a function $N(t)$ that tells how many yeast cells are in the bowl after t hours.
 - Evaluate $N(10)$. What does this represent?
 - Graph the function from part (a).
 - Use the graph to estimate how much time has elapsed if there are 4000 cells in the bowl.
- A colony of bacteria doubles in size every hour. Initially there are 32 bacteria in a dish that can contain 32 768 bacteria.

 - Write a function $N(t)$ that tells how many bacteria are in the bowl after t hours.
 - After how many hours is the dish full?
 - Suppose the colony started with 64 bacteria instead of 32. How much faster would the dish have filled up in this case?
- A large city has a population of 1 278 443 in the year 2000 and an expected population of 3 835 329 in the year 2050.

 - What is the growth rate per 50-year period?
 - Write the function $P(t)$ that tells what the population will be after t 50-year periods.
 - What value of t corresponds to the year 2060? What will the population be in that year?