Name _____ Class _____ Date _____

Practice 8-8

Exponential Growth and Decay

Write an exponential function to model each situation. Find each amount after the specified time.

1. Suppose one of your ancestors invested $500 in 1800 in an account paying 4% interest compounded annually. Find the account balance in each of the following years.

   a. 1850 b. 1900 c. 2000 d. 2100

2. Suppose you invest $1500 in an account paying 4.75% annual interest. Find the account balance after 25 yr with the interest compounded the following ways.

   a. annually b. semiannually c. quarterly d. monthly

3. The starting salary for a new employee is $25,000. The salary for this employee increases by 8% per year. What is the salary after each of the following?

   a. 1 yr b. 3 yr c. 5 yr d. 15 yr

4. Carbon-14 has a half-life of 5,700 years. Scientists use this fact to determine the age of things made of organic material. Suppose the average page of a book containing approximately 0.5 mg of carbon-14 is put into a time capsule. How much carbon-14 will each page contain after each of the following numbers of years?

   a. 5700 b. 11,400 c. 22,800 d. 34,200

5. The tax revenue that a small city receives increases by 3.5% per year. In 1990, the city received $250,000 in tax revenue. Determine the tax revenue in each of the following years.

   a. 1995 b. 1998 c. 2000 d. 2006

6. Suppose the acreage of forest is decreasing by 2% per year because of development. If there are currently 4,500,000 acres of forest, determine the amount of forest land after each of the following.

   a. 3 yr b. 5 yr c. 10 yr d. 20 yr

7. A $10,500 investment has a 15% loss each year. Determine the value of the investment after each of the following.

   a. 1 yr b. 2 yr c. 4 yr d. 10 yr

8. A city of 2,950,000 people has a 2.5% annual decrease in population. Determine the city's population after each of the following.

   a. 1 yr b. 5 yr c. 15 yr d. 25 yr

9. A $25,000 purchase decreases 12% in value per year. Determine the value of the purchase after each of the following.

   a. 1 yr b. 3 yr c. 5 yr d. 7 yr