Name: _____ Period: _____

Score:

_____/_____

_____%

HW 4-4 HONORS: Growth & Decay

1. From 1997 to 2002, the number n (in millions) of DVD players sold in the United States can be modeled by $n = 0.42(2.47)^t$ where t is the number of years since 1997.

a) Identify the initial amount

$$0.42$$

b) Identify the growth factor

$$2.47$$

c) Identify the annual percent increase.

$$147\%$$

2. Each March from 1998 to 2003, a website recorded the number y of referrals it received from Internet search engines. The results can be modeled by $y = 2500(1.50)^t$ where t is the number of years since 1998.

a) Identify the initial amount

b) Identify the growth factor

c) Identify the annual percent increase

3. The value of a car can be modeled by the equation $y = 24,000(0.845)^t$ where t is the number of years since the car was purchased.

a) Identify the initial amount

$$24,000$$

b) Identify the decay factor

$$0.845$$

c) Identify the annual percent decrease

$$-15.5\%$$

4. Adella bought a car for $10,000. One year later, the car was worth $8,000. A year after that, the car was worth $6,400.

  a) Write an explicit equation for how much the car will be worth after n years.

  b) How much will the car be worth after 5 years (Round to the nearest hundredth)?

5. The Work-Out Gym sold 550 memberships in 2001. Since then the number of memberships sold has increased 3% annually.

  a) Write an explicit equation.

  $$f(x) = 550(1.03)^{x-2001}$$

  b) How many members will there be in 2020.
  (Round to the nearest whole number.)

  $$f(2020) = 964 \text{ members}$$

6. The number of people who own computers has increased 23.2% annually since 1990. In 1990, half a million people owned a computer.

  a) Write an explicit equation.

  b) Predict how many people will own a computer in 2015.
  (Round to the nearest whole number.)

7. Cami purchased a rare coin form a dealer for $300. The value of the coin increases 5% each year.

  a) Write an explicit equation

  $$f(x) = 300(1.05)^x$$

  b) How much will the coin be worth in 5 years? (Round to the nearest hundredth.)

  $$f(5) = \$382.88$$

8. In the years from 2010 to 2015, the population of the District of Columbia is expected to decrease about 0.9% annually. In 2010, the population was about 530,000.

  a) Write an explicit equation.

  b) What is the population expected to be in 2015?
  (Round to the nearest whole number.)

9. Leonardo purchases a car for 18,995. The car depreciates at a rate of 18% annually. After 6 years, Manuel offers to buy the car for $4,500. Should Leonardo sell the car? **Explain.**

$$f(x) = 18995(0.82)^x$$

$$f(6) = \$5774.61$$

No, he shouldn't sell because after 6 years the car is worth $5774.61. More than the $4,500 that Manuel offered.

10. Susan puts her $2,000 she saved from her summer job into a savings account. The account earns 1.6% interest each year.

    a) Write an explicit equation

    b) How much money will she have in 13 years? (Round to the nearest hundredth.)

11. Circle all of the growth functions.

$y = 0.3(1.5)^t$	$y = 7(0.53)^t$	$y = 65(0.987)^{t-2001}$	$y = 4.5(2.58)^x$	$y = 0.41(1.1)^x$

12. You are running a new city.
    a. Choose a starting amount for the population in your new city.

    b. Your city is growing by 300%. Write an explicit equation for your city.

    c. Which of the following statements is true about your city?

        A. Your city's population is doubling every year.

        B. Your city's population is tripling every year.

        C. Your city's population is quadrupling every year.