Name: _____   Date: _____

$$A = P(1+r)^t$$

A = Amount at any given time

P = Principal (amount you start with)

r = rate (of increase or decrease)

t = time in years

$$A = P(1-r)^t$$

Example 1

Twenty grams of Carbon is stored in a container. The amount C (in grams) of Carbon present after t years decreases by 1.2%.
A.   Write a model for the amount of Carbon present in the container in terms of years since being contained.
B.   How much Carbon is present after 1500 years?
C.   How long will it take for the Carbon to reach its half-life?
D.   How long will it take for there to be 5 grams of Carbon?

Example 2

In the year 1990, kids everywhere collected Beanie Babies. There was such a demand that these critters skyrocketed in value. Katie bought a Beanie Baby for $10.00. The stuffed animals' value increased at a rate of 7% per year.
A.)   Write an exponential growth model for the value of the Beanie Baby in terms of the number of years since the purchase.
B.)   What was the value of the Beanie Baby after 2 years?
C.)   How much is it worth today?
D.)   How long did it take for Katie to double her original investment?

1. In1990, the tuition at a private college was $15,000. During the next 9 years, tuition increased by about 7.2% each year.

    a. Write a model giving the cost C of tuition at the college t years after 1990.

    b. What is the tuition in 2010?

    c. What year was the tuition $20,000?

2. You purchase a stereo system for $830. The value of the stereo system decreases 13% each year.

    a. Write an exponential decay model for the value of the stereo system in terms of the number of years since the purchase.

    b. What is the value of the system after 2 years?

    c. When will the stereo be worth half the original value?

3. You have bought a new car for $26,500. The value y of the car decreases by 18% each year.

    a. Write an exponential decay model for the value of the car.

    b. Use the model to find the value of the car after three years.

    c. When will the car have a value of $18,000? Give your answer to 3 decimal places.