MATH 123 Homework Section . Exponential Decay

Section:_____ **Name:**_____

Show all work and setups in order to receive full credit.

1. The half-life of a radioactive substance is one day, meaning that every day half of the substance has decayed. Suppose you have 100 grams of this substance.

    a. Construct an exponential model for the amount of the substance remaining on a given day.

    b. How much of the substance would be left after a week?

2. Suppose a tortoise is 2000 feet from the ocean. Each day the tortoise travels one-half of the remaining distance to the ocean. Use this information to:
    a. Construct a model that represents the remaining distance that the tortoise must travel to reach the ocean.

    b. Compute the remaining distance to the ocean after 4 days of travel.

3. A certain vehicle loses 35% of its value each year.
    a. If the vehicle has an initial value of $25,000, construct a model that represents the value after x years.

    b. Compute the value of the vehicle at the end of the 3rd year.

4. Atmospheric pressure decreases by about 12% for every 1000 meters you climb. The pressure at sea level is about 1013 atmospheres.

    a. Construct a model to represent the atmospheric pressure at a given altitude in thousands of meters.

    b. How many atmospheres of pressure will you feel at 5,895meters? *(Top of Mt. Kilimanjaro)*

    c. How many atmospheres of pressure will you feel at 8,848 meters? *(Top of Mt. Everest)*

    d. How many atmospheres of pressure will you feel at 383 meters? *(highest point in Indiana)*