**Notes**

1. Depending on the aggressiveness of a breast tumor, its volume can double in weeks or months. On average, the volume of a breast tumor doubles every 100 days. Using an initial volume of 0.06 cm3 (the minimal tumor volume detectable by a mammogram) and measuring time in days after the tumor reached that initial volume,
   1. Identify the variables.
   2. Create a function describing volume as a function of time. Round to 3 decimals.
   3. Find the inverse,, (create a function describing time as a function of volume).
   4. Using the function from **part c**, how many days would it take the tumor to reach a volume of 4.2 cm3 (the smallest size tumor detectable by touch)?
   5. Interpret the answer from **part d** in the context of the problem.
2. If *N = f (A)* gives the number of gallons of paint *N* needed to cover a house of area *A* in ft2,
   1. What does  represent?
   2. What does  represent?
3. For the years 1975 – 1991, the percent of high school seniors who have tried cigarettes is given by *C = f(t) = 75.451 – 0.707t,* where *t* is the time in years since 1975*.*
4. Define the variables.
5. Find the inverse of this function.
6. Evaluate *f(30).* Explain the meaning of the answer in the context of this problem.
7. Use the inverse function found in part b to find the year in which the percent of high school seniors who have tried cigarettes was 65%. Show your work.
8. The top notch advertising firm of Wellborn, Wilson, and Welty need to model the weekly retail sales of Getz & Goldstein’s Magic Coffee Beans. They know from previous experience that this can be modeled using an exponential function. The initial retail sales were $40,000. After three weeks, sales were $28,600.

Let *S* = *f*(*w*) where *S* is the total retail sales in dollars and *w* is the number of weeks.

1. Identify the variables.
2. Write an equation for *S*. Show all work. Round your answers, when necessary, to three decimal places.
3. Complete the following statement:
   * + In the function *f*, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a function of \_\_\_\_\_\_\_\_\_\_\_\_\_.
4. What is the growth/decay rate? Write a sentence that describes this rate in context.
5. Find .
6. Complete the following statement:
   * In the function , \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a function of \_\_\_\_\_\_\_\_\_\_\_\_\_.
7. Evaluate and interpret what this means in the context of the situation.
8. You have been invited to join the Goldstein’s Golden Oldies CD club. The club has an initial membership fee and a fixed price per CD. If you buy 12 CDs, you pay $131.00. If you buy 20 CDs, you pay $195.00.

Let *P* = *f*(*c*) where *P* is the price of the CDs in dollars and *c* is the number of CDs.

1. Identify the variables.
2. Write an equation for *P*. Show all work.
3. Interpret the slope in context.
4. Complete the following statement:
   * + In the function *f*, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a function of \_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Find .
6. Complete the following statement:

* In the function , \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a function of \_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Evaluate *f*(75) and interpret what this means in the context of the situation.
2. Evaluate and interpret what this means in the context of the situation.