NCM1B Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 5 Lesson 2.5 Homework: More Explicit Growth and Decay**

**1. Suppose an investment of $500 doubles in value every 15 years. How much is the investment worth
 after 30 years? After 45 years?**

1. What is the initial amount for this scenario? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. What is the growth rate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ How often does it grow? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c. Use the words NOW and NEXT to write a rule for this scenario.

 Next = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Start at \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 d. Write an explicit equation to determine the amount of money remaining, *y,* during any given year, *x.*

 y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 e. Using the equation above, predict how much the investment will be worth after 30 years. \_\_\_\_\_\_\_\_\_\_

 f. Using the equation above, predict how much the investment will be worth after 45 years? \_\_\_\_\_\_\_\_\_\_

**2. Sr-85 is used in bone scans. It has a half-life of 64.9 days. Write the exponential decay function for
 an 8-mg sample. Find the amount remaining after 100 days.**

 a. What is the initial amount for this scenario? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. What is the rate of decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ How often does it decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c. Use the words NOW and NEXT to write a rule for this scenario.

 Next = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Start at \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 d. Now, write an explicit equation $(y=)$ for this scenario.

 y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 e. Use one of the rules above to predict how much Sr-85 would remain after 100 days. \_\_\_\_\_\_\_\_\_\_\_\_

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| --- |
| **Sam’s Shooter** |
| ***t*** | ***h*** |
| 0 | 7 |
| 0.5 | 9 |
| 1 | 10 |
| 1.5 | 10 |
| 2 | 9 |
| 2.5 | 7 |
| 3 | 4 |
| 3.5 | 0 |

3. **Comparing Quadratics:** Sally and Sam are testing out their new potato shooters from their tree houses which are at different heights. The table shows the time, *t*, in seconds and height, *h*, in meters of the potato pieces shot from Sam’s shooter. The time, *t*, and height, *h(t)*, of Sally’s potato shooter can be represented by the following equation: $h\left(t\right)=-t^{2}+4t+5.$

1. Whose potato piece hit the ground first?
2. What is the difference in seconds between when Sally and Sam’s potatoes hit the ground?