Name: _____ Date: _____ Period: _____

Growing, Growing, Growing, Assignment # 7

1. Penicillin decays exponentially in the human body. Suppose you receive a 300-milligram dose of penicillin to combat strep throat. About 180 milligrams will remain active in your blood after 1 day.

a. What is the decay factor?

b. Assume the amount of penicillin active in your blood decreases exponentially. Make a table showing the amount of active penicillin in your blood for 7 days after a 300-milligram dose.

Day	0	1	2	3	4	5	6	7
Active Penicillin	300							

c. Write an equation for the relationship between the number of days d since you took the penicillin and the amount of the medicine m remaining active in your blood.

d. What would be the equation if you had taken a 400-milligram dose?

In Exercises 2 and 3, tell whether the equation represents exponential decay or exponential growth. Explain your reasoning.

2. $y = \frac{1}{2}(1.1)^x$

3. $y = 300(\frac{1}{2})^x$

4. Consider these equations:

A) $y = 0.75^x$　　　B) $y = 0.25^x$　　　C) $y = -0.5x + 1$　　D) $y = 1.25^x$　　　E) $y = 2.5^x$

a. Which equations represent exponential decay? What is the decay factor for each equation?

b. Which equations represent exponential growth? What is the growth factor for each equation?

Given each decay rate write the decay factor.

5. 20%　　　　　　**6.** 15%　　　　　　**7.** 5%　　　　　　**8.** 70%

9. A poor investment was worth $9000 in the beginning, $7200 after the first year, and $5760 after the second year.

a. [2 pts] What is the decay rate?   **b.** [2 pts] What is the decay factor?

c. [2 pts] Write an equation representing this relationship.

d. [2 pts] How much is the investment worth after 8 years?

10. In some areas, the number of desert tortoises has decreased dramatically due primarily to human activity. In the 1950's the desert tortoise population averaged at least 200 adults per square mile. It is estimated that the population decreases by an average of 3 adult tortoises per year.

a. [2 pts] How many desert tortoises per square mile would there be after 5 years?

b. [2 pts] How many desert tortoises per square mile would there be after 65 years?

11. A $10,000 investment has a 9% _gain_ each year. Determine the value of the investment after each of the following years. [3 pts each]

a. 2 years   **b.** 10 years

12. Draw a graph showing a linear relationship.

13. Draw a graph showing exponential decay.