8E Growth/Decay & Simple/Compound Name: _____ Per: _____
SHOW YOUR WORK AND WORK IN PENCIL

Determine the common ratio (multiplier) for each growth or decay rate.

1. 13% Decay _____   3. 11% Growth _____   5. .25% growth _____

2. 3.5% Decay _____   4. 97% Decay _____   6. 4.5% Decay _____

7. Explain your reasoning for your answer for the multiplier in number 3. _____
_____

8. Explain your reasoning for your choice of multiplier in number 1. _____
_____

Depreciation is the value something loses over time. For the example, you lose value of a new phone when you open the package. Assume that each of the following was purchased in **2005** for the price listed. With a **9% compound depreciation** per year. Answer of the following questions.

9. Cell phone: $250.00   10. Used car: $8000
   a. Table

x	Pattern	f(x)	S.H.

   a. Table

x	Pattern	f(x)	S.H.

   b. Common ratio/multiplier?_____   b. Common ratio/multiplier?_____

   c. Recursive Eq: _____   c. Recursive Eq: _____

   d. Explicit Eq: _____   d. Explicit Eq: _____

   e. Value of the phone in 2019? _____   e. Value of the car in 2019? _____

   f. When will the phone be worth $0?_____

Write equations for the value of the following if they depreciated by compound rate of 13.5%per year.

11. Cell phone: $250.00   12. Used car, $8000.

   a. Recursive Equation: _____   a. Recursive Equation: _____

   b. Explicit Equation:_____   b. Explicit Equation:_____

13. In 2015, Robyn's mom bought her an iPhone 4 for $299.00. It's seriously out of date but her mom will only buy her a new phone if Robyn sells her old phone to help buy a new phone.
   a. Write an equation to find a fair price for the phone. Assume a compounded depreciation rate of 16.5% per year? _____
   b. How much will phone be worth in 2019 if Robyn keeps the phone? _____

14. What is the difference between **simple interest** and **compound interest**? _____
_____

E.C. Interest earned is $200 for 2 years with at a simple interest of 10%. What is the principal (initial) amount?

15. Anne takes out a $400 loan at a 20% annual **SIMPLE** interest rate. She doesn't make any payments.
   a. Is this an example of an arithmetic or geometric sequence? _____
   b. What is the common difference/ratio? _____
   c. How much interest will she owe year 1?_____
   d. Make a table to show how much she owes
   e. Write a recursive equation: _____
   f. Write an explicit equation: _____
   g. What is f(7)? _____ What does that
      mean? _____

x	Pattern	$f(x)$	S.H.
0			
1			
2			
3			

16. Ben puts $900 into an account at 8% yearly rate
   a. Fill out the table showing **SIMPLE** interest rate
   b. How much money does he make **just in interest**
      the first year? _____
   c. Write the recursive equation: _____
   d. Write the explicit equation: _____
   e. What is his total money at $f(3)$. _____

y	Pattern	$B(y)$	S.H.
0			
1			
2			
3			
x			

17. Dan deposits $900 into an account at 8% yearly rate
   a. Fill out the table showing **COMPOUND** rate.
   b. How much money does he make **just in interest** the first year? _____
   c. Write the recursive equation: _____
   d. Write the explicit equation: _____

y	Pattern	$D(y)$	S.H.
0			
1			
2			
3			
x			

   e. What is his total money at $f(3)$. _____

18. Fill in the blanks in the following table.
   a. Common difference: _____
   b. Common ratio: _____

n	0	1	2	3	4
Arithmetic $A(n)$	3	6			
Geometric $G(n)$	3	6			

   c. Write recursive equation for Arithmetic: _____
   d. Write the explicit equation for Arithmetic: _____
   e. Write recursive equation for Geometric: _____
   f. Write the explicit equation for Geometric:_____
   g. Graph and label the two sequences to the right.
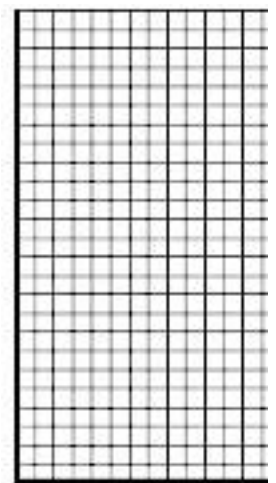
19. A stock market account has grown according to the equation
   $m(y) = 5400(1.085)^{y-1}$ where y is the number of years the account has grown.
   a. How much money was deposited in the bank? _____
      How do you know? _____
   b. What is $m(1)$?_____ What does this mean? _____
   c. What is the common ratio/Multiplier? _____ What is the interest rate for the account? _____
   d. What would be the recursive equation? _____
   e. If the money is left and continues to grows, what is the balance after 10 years? _____