

Review: Unit 9

I. Vocabulary Review

A. Put each phrase in either the linear or exponential category.

	Linear Functions	Exponential Functions	
Line graph			Y values form an arithmetic sequence
Common ratio			Multiply to get the next term
Y values form a geometric sequence			curved graph
	Add to get the next term	Common difference	

B.

Give an example of an arithmetic sequence: _____

Write a formal recursive formula for your sequence: _____

Give an example of a geometric sequence: _____

Write a formal recursive formula for your sequence: _____

C.

The **initial amount** of a sequence is paired with _____ in a table

On a graph it is called the _____ - _____.

That is where the graph crosses the _____ - _____.

II. For a sequence, write arithmetic and the common difference or geometric and the common ratio. If a sequence is neither arithmetic nor geometric, write neither.

1) 2, 5, 8, 11, 14, ... _____ common _____ = _____

2) 18, 6, 2, 2/3, ... _____ common _____ = _____

3) 4, -8, 16, -32, ... _____ common _____ = _____

4) $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, 1, 3, \dots$ _____ common _____ = _____

5) $-5, -3, -1, 1, 3, \dots$ _____ common _____ = _____

III. Given the first term and either common difference or common ratio, write the first 6 terms of the sequence.

1) First term = 3 , common ratio = 5 _____

2) $a_1 = 4 , d = 4$ _____

3) $a_1 = 5 , r = -1/3$ _____

4) first term = 6, common difference = -2 _____

IV. For a sequence, write arithmetic and the common difference or geometric and the approximate common ratio. If a sequence is neither arithmetic nor geometric, write neither. Also include the equations asked for.

a) $5, 7.5, 11.25, 16.88, 25.31, \dots$ _____ common _____ = _____

b) $4.3, 8.3, 12.3, 16.3, \dots$ _____ common _____ = _____

c) $-2, 12, -72, 432, -2592, \dots$ _____ common _____ = _____

V. A ladybug population starts with 10 ladybugs and triples every week.

1) Complete the table.

Weeks	0	1	2	3
# of Ladybugs				

2) Graph the data. Label axes.

3) Is the data linear or exponential?

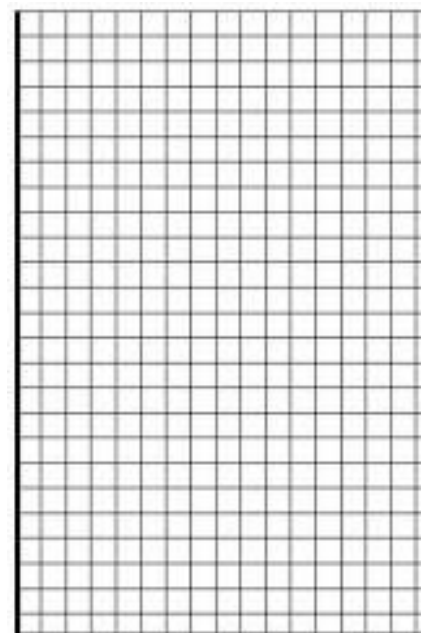
4) What is the common ratio or difference?

5) Write a formal recursive equation for the data.

6) Write the explicit formula for the data.

7) How many ladybugs will be in the population after 12 weeks?

8) How long will it take to have at least 10,000 ladybugs?



VI. Solve each of the following

1. An exponentially decaying radioactive ore originally weighs 30 grams and is reduced to 15 grams in 100 years. How much will be left in 400 years? Write an exponential decay function in order to find the solution

Function: _____ Amount remaining: _____

2. Hg-197 is used in kidney scans and it has a half-life of 2 days. Write the exponential decay function for a 7-mg sample. Find the amount remaining after 6 days.

Function: _____ Amount remaining: _____

3. A ball is dropped from a height of 81 feet into a parking lot and keeps bouncing up and down. Each bounce is $\frac{3}{5}$ of the drop height.

Explicit Equation: _____ Height after 4th bounce: _____

3. Complete the table by answering the following questions about each situation.

	SITUATION:	Is the sequence arithmetic, geometric, or neither?	Does this represent growth or decline or neither?	What is the Common Ratio or Common Difference, if it exists?
a)	A child's height increases by 2 inches each year.			
b)	A baby gains 3 pounds each month.			
c)	The amount of money in your bank account triples each year (we wish!)			
d)	The town's population is decreasing by one tenth each year.			
e)	8 students are dropping out of the college each year.			