9B Geometric Sequences
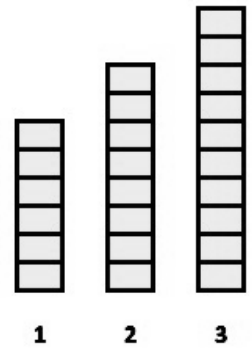
Name: _____Per: _____

SHOW YOUR WORK. WORK IN PENCIL.

1. Gavin needs to get into shape because he keeps chewing gum in class. He keeps track of the number of push-ups he can do in the chart below if he starts with day 1 to the right.

    a. Make a four column table with the number of push-ups he does each day.

| n	Pattern	$f(n)$	Shorthand
1			
2			
3			
4			
5			

b. Assuming the pattern continues, how many push-ups will he do on day 10? _____

c. Is this pattern arithemetic? _____ Explain _____

d. Write a recursive equation representing the number of push-ups on any day _____

e. Write an explicit equation to show how many push-ups Gavin will do on day n. (Use proper function notation.) _____

2. His friend, Phillip decides to start by doing 1 push-up on the first day. The next day, he doubles the number of push-ups. He continues to double the number of push-ups each day.

    a. Make a four column table with the number of push-ups Phillip does.

n	Pattern	$f(n)$	Shorthand
1			
2			
3			
4			
5			
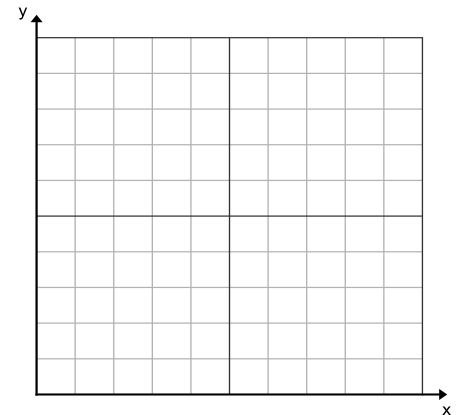
b. Who will do more push-ups on day 4? _____

c. How many push-ups will Phillip do on day 8? _____

d. Is this pattern arithemetic? _____ Explain _____

e. Graph (and label) the table for **both boys** on the grid to the right.

3. Use tables to **evaluate $f(x)$ for each equation** when $\mathbf{x = \{-1, 0, 1, 2\}}$.

a. $f(x) = 10^x$

x	$f(x)$
-1	
0	
1	
2	

b. $f(x) = (-3)^x$

x	$f(x)$
-1	
2	

c. $f(x) = -3^x$

x	$f(x)$
-1	

d. $f(x) = 2^{x-1}$

x	$f(x)$

Complete the following. If neither, explain why.

4. $4, 14, 24, 34, 44, \ldots$

Arithmetic/Geometric/Neither

Common Difference/Ratio: _____

Next two terms: _____ , _____

5. $3, 15, 75, 375, \ldots$

Arithmetic/Geometric/Neither

Common Difference/Ratio: _____

Next two terms: _____ , _____

6. $-1, 6, -36, 216, \ldots$

Arithmetic/Geometric/Neither

Common Difference/Ratio: _____

Next two terms: _____ , _____

7. Mr. Mann, a math teacher, has a 10% off late paper policy. Each day that an assignment is late a student receives 90% of the credit he or she would have received the day before.

a. Make a table to show the potential credit that can be earned. **Use a fraction to show the loss in credit.**

x	Pattern	y	Short Hand
0		100	
1		90	
2		81	
3			
4			

b. After how many days would your score for a late assignment drop below 50%? _____

c. When will your score reach 0? _____ Explain. _____
_____

d. Write a recursive equation: e. Write an explicit equation:

_____   _____

Use the explicit equation to **find the common ratio r and $f(2), f(3), f(4)$ & $f(8)$. Make a 4-column table** to help find your values.

8. $f(n) = 2\left(\frac{1}{2}\right)^n$ $r =$ _____

0		2	

$f(2) =$ _____ $f(3) =$ _____

$f(4) =$ _____ $f(8) =$ _____

Given the **recursive formula** for the **geometric sequence find $f(2), f(3), f(4)$ and the common ratio r.**
Extra Credit: Write the explicit formula.

9. $f(n) = f(n-1)(2)$ and $f(1) = 2$

$f(2) =$ _____ $f(3) =$ _____

$f(4) =$ _____ $r =$ _____

EC: Explicit Formula: _____

10. $f(n) = f(n-1) \times 3$, and $f(1) = -3$

$f(2) =$ _____ $f(3) =$ _____

$f(4) =$ _____ $r =$ _____

EC: Explicit Formula: _____

Given a term in the **geometric sequence** and the **common ratio "r", find the two terms starting with $f(2)$.**
Write the explicit and recursive formulas.

11. $f(0) = 5, r = 5$

$f(2) =$ _____   Explicit = _____

$f(3) =$ _____   Recursive = _____

12. $f(1) = 4, r = -3$

$f(2) =$ _____   Explicit = _____

$f(3) =$ _____   Recursive = _____

Finish each table. Circle "A" if Arithmetic or "G" if Geometric. List the common difference OR common ratio. Write the recursive AND explicit equations in function notation.

13.

Term	1st	2nd	3rd	4th	5th	6th	7th	8th
Value	3	8	13	18	23			

A or G   d OR r = _____ Recursive Equation: _____ Explicit Equation: _____

14.

Term	0	1st	2nd	3rd	4th	5th	6th	7th
Value	3/2	3	6	12	24			

A or G   d OR r = _____ Recursive Equation: _____ Explicit Equation: _____