

Name: _____

Date: _____

Some Additional Sequences Review

1. The explicit rule for a sequence is $f(n) = 3.5(n - 1) + 10$. What would the recursive function be for the same sequence?

$a_n = a_1 + d(n-1)$ $d = 3.5$ $a_n = a_{n-1} + d$
 $a_1 = 10$ $a_n = a_{n-1} + 3.5$

2. Consider the following:

n	1	2	3	4
f(n)	6	12	24	48

a) State whether the function is arithmetic or geometric GEOMETRIC 6, 12, 24, 48, ...

b) Give an explicit rule:

$a_n = 6 \cdot (2)^{n-1}$ $r = 2$
 $a_1 = 6$ $a_1 = 6$

c) Give a recursive rule:

$a_1 = 6$
 $a_n = a_{n-1} \cdot 2$

3. Consider the following:

n	1	2	3	4
f(n)	29	24	19	14

a) State whether the function is arithmetic or geometric ARITHMETIC 29, 24, 19, 14, ...

b) Give an explicit rule:

$a_n = 29 - 5(n-1)$ $d = -5$

c) Give a recursive rule:

$a_1 = 29$ $a_1 = 29$
 $a_n = a_{n-1} - 5$

4. Write the first 5 terms of for each sequence below, given the recursive rule.

a) $a_1 = 6$

$a_n = a_{n-1} + 11$

6, 17, 28, 39, 50

b) $a_1 = 3$

$a_n = 7a_{n-1}$

3, 21, 147, 1029, 7203

c) $a_1 = 2$

$a_n = -3a_{n-1} - 9$

2, -15, 36, -99, 288

RULE: mult. -3 then subtract 9

6. Determine and state whether the sequence 1, 3, 9, 27, ... displays **exponential** behavior. Explain how you arrived at your decision.

7. Alexis, James, and Gregg are playing a game of HQ. There are 944,784 players at the start of the game. After one trivia question, there are 314,928 players remaining. The table below represents players left in the game if the pattern continues after n questions.

n	a_n
0	944,784
1	314,928
2	104,976



arithmetic
or
geometric

a) Write an explicit formula for the number of players remaining after n questions are asked:

$\star a_n = a_1 \cdot (r)^{n-1}$ $a_n = 314,928 \cdot \left(\frac{1}{3}\right)^{n-1}$

b) The game ends after 10 questions. How many players won the game? Only an algebraic solution will receive full credit.

$a_{10} = 314,928 \cdot \left(\frac{1}{3}\right)^{10-1}$
 $a_{10} = 16$

c) If the game lasted 12 questions, how many players would remain? Does this number make sense in the context of the question? Explain your answer.

$a_{12} = 1.777\dots$