Name_____ Date_____

Algebra 1 CC Period_____

Sequences Test

Show all work where possible

****All explicit formulas must be in simplest form****

Due:_____

#'s 1-14: 4 points each #'s 15-20: 6 points each #21: 8 points

1) Which of these are arithmetic sequences? I. 9,15,21,27,33,... II. 18, 10, 2, -6, -14,... III. 7, 11, 16, 22, 29,... IV. 1, -2, 3, -4, 5, -6, 7, -8, 9,... A) I only B) I and II only C) I, II, and III, only D) I, II, III, and IV.	2) Which is the correct formula for a_n in the given sequence: 2, 5, 10, 17, ...? A) $a_n = 2^n + 1$ B) $a_n = n^2 + 1$ C) $a_n = 2n + 1$ D) $a_n = 3n - 1$
3) What is the formula for the nth term of the sequence 10, 12, 14, 16, ...? A) $a_n = 10(2)^n$ B) $a_n = 10(2)^{n-1}$ C) $a_n = 8 + 2n$ D) $a_n = 10 + 2n$	4) If $a_5 = 100$ and $a_{11} = 10$ are two terms of an arithmetic sequence, then what is the value of a_9? A) 15 B) 40 C) 70 D) 85
5) A sequence has the following terms: $a_1 = 4$, $a_2 = 10$, $a_3 = 25$, $a_4 = 62.5$. Which formula represents the nth term in the sequence? A) $a_n = 4 + 2.5n$ B) $a_n = 4 + 2.5(n - 1)$ C) $a_n = 4(2.5)^n$ D) $a_n = 4(2.5)^{n-1}$	6) Which arithmetic sequence has a common difference of 4? A) {0, 4n, 8n, 12n,...} B) {n, 4n, 16n, 64n,...} C) {n+1, n+5, n+9, n+13...} D) {n+4, n + 16, n + 64, n + 256...}
7) Which of the following function formulas describes the sequence {4, 8, 16, 32, 64,...} A) $f(n) = n + 4$ B) $f(n) = 2^n$ C) $f(n) = 4n$ D) $f(n) = 2^{n+1}$	8) What are the first three terms of this sequence? $a_n = n^2 + 1$ A) 0, 2, 5 B) 2, 5 10 C) 1, 2,3 D) 4, 9, 16

9) What is the tenth term of this sequence?
$a_n = (-1)^{n-1} \cdot n^2$

A) 10
B) -10
C) 100
D) -100

10) Given the sequence: {5, 7, 9, 11, ...}. Which explicit formula generates this sequence?

A) $f(n) = 3n + 2$
B) $f(n) = 2n - 3$
C) $f(n) = 2n + 3$
D) $f(n) = 3n - 2$

11) The first four terms of a sequence are: 8, 24, 72, 216, ... Write a recursive function for this sequence.

A) $a_1 = 8$ and $a_n = a_{n-1} + 3n$
B) $a_1 = 8$ and $a_n = a_{n-1} \cdot 3n$
C) $a_1 = 8$ and $a_n = a_{n-1} \cdot 3$
D) $a_1 = 8$ and $a_n = a_{n-1} + 3$

12) When graphed:

A) An arithmetic sequence produces what type of function?

_____

B) A geometric sequence produces what type of function?

_____

13) Write a recursive formula for the given sequence: {4, 40, 400, 4000, ...}

14) Write an explicit formula for the given sequence: {1, 4, 16, 64, ...}

15) Given the sequence: 2, 10, 18, 26, ...

A) Write a formula for the nth term of the sequence. (Show work on how you got it)

B) Find the 100th term of the sequence

16) Given the following table:

n	$f(n)$
1	5
2	-10
3	20
4	
5	

A) Fill in the next values in the table

B) Find the <u>rule</u> for the sequence

17) List the **first five** terms of the following sequence: $f(n) = f(n-1) + n$ and $f(1) = 4$

18) A large half-circle theatre has 50 seats in the first curved row, 58 seats in the second row, 66 seats in the third row, and so on. If the sequence continues, how many seats are in the last row of the theatre if there are 30 rows? (Don't forget to figure out your explicit formula first & show work!!)

19) Given the following information: $a_n = -3a_{n-1}$ for $a_1 = 4$

A) Find the common difference or ratio _____

B) Find the first 3 terms

C) Find the explicit formula

20) Given the following information: $a_n = a_{n-1} - 6$ for $a_1 = -3$

A) Find the common difference or ratio _____

B) Find the first 3 terms

C) Find the explicit formula (in simplest form)

21) Jacqueline has a clothing store gift card worth $250. After she buys her first outfit, the card value is $207.25. After she buys a second outfit, its value is $164.50. After she buys the third outfit, the card is worth $121.75.

A) Assuming the pattern continues, write an equation to define $A(n)$, the amount of money on the gift card after n outfits. (Show work)

B) Jacqueline buys an outfit every Saturday afternoon. How many weeks in a row can she afford to buy an outfit, using her gift card only?