

Name \_\_\_\_\_

Date \_\_\_\_\_

Algebra 1 CC

Period \_\_\_\_\_

## Sequences Take Home Test

\*Show all work where possible\* \*All explicit formulas should be in simplest form\*

Due: \_\_\_\_\_

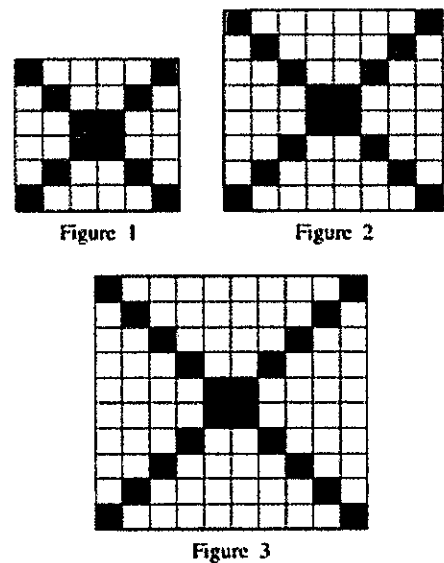
#'s 1-15: 4 points each #'s 16-20: 8 points each

<p>1) Which of these are arithmetic sequences?</p> <p>I. 2, 4, 6, 8, 10...</p> <p>II. 2, 4, 8, 16, 32...</p> <p>III. <math>a, a + 2, a + 4, a + 6, a + 8...</math></p> <p>A) I and III only            B) I and II only            C) II, and III, only            D) I, II, and III</p>	<p>2) Which is the correct formula for <math>a_n</math> in the given sequence: (show work)</p> <p>2, 5, 8, 11, ...</p> <p>A) <math>a_n = 2(3)^{n-1}</math>            B) <math>a_n = 2 + 3(n - 1)</math>            C) <math>a_n = 2 - 3(n - 1)</math>            D) <math>a_n = 2(3)^{n-1}</math></p>
<p>3) What is the formula for the <math>n</math>th term of the sequence 10, 12, 14, 16, ...? (show work)</p> <p>A) <math>a_n = 10(2)^n</math>            B) <math>a_n = 10(2)^{n-1}</math>            C) <math>a_n = 8 + 2n</math>            D) <math>a_n = 10 + 2n</math></p>	<p>4) In a geometric sequence, the first term is 4 and the common ratio is -3. The fifth term of the sequence is?</p> <p>A) 324            B) 108            C) -108            D) -324</p>
<p>5) A sequence has the following terms: <math>a_1 = 4</math>, <math>a_2 = 10</math>, <math>a_3 = 25</math>, <math>a_4 = 62.5</math>. Which formula represents the <math>n</math>th term in the sequence?</p> <p>A) <math>a_n = 4 + 2.5n</math>            B) <math>a_n = 4 + 2.5(n - 1)</math>            C) <math>a_n = 4(2.5)^n</math>            D) <math>a_n = 4(2.5)^{n-1}</math></p>	<p>6) Which of the following is equivalent to <math>(.25)^{x+7}</math> ?</p> <p>A) <math>(.25)^{\frac{x}{7}}</math>            B) <math>((.25)^x)^7</math>            C) <math>(.25)^x \cdot (.25)^7</math>            D) <math>(.25)^x + (.25)^7</math></p>
<p>7) Which of the following function formulas describes the sequence {4, 8, 16, 32, 64,...} (Show work)</p> <p>A) <math>a_n = n + 4</math>            B) <math>a_n = 2^n</math>            C) <math>a_n = 4n</math>            D) <math>a_n = 2^{n+1}</math></p>	<p>8) What are the first three terms of this sequence? <math>a_n = n^2 + 1</math> (show work)</p> <p>A) 0, 2, 5            B) 2, 5, 10            C) 1, 2, 3            D) 4, 9, 16</p>

<p>9) What is a common ratio of the geometric sequence whose first term is 5 and third term is 245? (Show work)</p> <p>A) 7          B) 49          C) 120          D) 240</p>	<p>10) Given the sequence: {5, 7, 9, 11, ...}. Which explicit formula generates this sequence? (show work)</p> <p>A) <math>a_n = 3n + 2</math>          B) <math>a_n = 2n - 3</math>          C) <math>a_n = 2n + 3</math>          D) <math>a_n = 3n - 2</math></p>
<p>11) If <math>x \neq 0</math>, then the common ratio of the sequence <math>x, 2x^2, 4x^3, 8x^4, 16x^5, \dots</math> is?</p> <p>A) <math>2x</math>          B) 2          C) <math>x</math>          D) <math>\frac{1}{2}x</math></p>	<p>12) When graphed:</p> <p>A) An arithmetic sequence produces what type of function?</p> <p>B) A geometric sequence produces what type of function?</p>
<p>13) The 24<sup>th</sup> term of the sequence -5, -11, -17, -23... is? (show work)</p> <p>A) -149          B) -143          C) 133          D) 139</p>	<p>14) Write an explicit formula for the given sequence: {1, 4, 16, 64, ...} (show work)</p>

15) The shaded boxes in the figure represent a sequence. If figure 1 represents the first term and this pattern continues, how many shaded blocks will be in figure 35? (Show work)

- A) 55
- B) 148
- C) 420
- D) 805



16) 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.

A) If the pattern continues, determine and state a formula that can be used to determine how many seats are in the  $n$ th row.

B) Use your formula from above to determine how many seats are in the last row of the theatre if there are 30 rows.

17) Determine the common difference of the arithmetic sequence in which  $a_1 = 5$  and  $a_5 = 17$ .  
(Hint: use the slope formula)

Determine the 21st term of this sequence.

18) Given the following information:  $a_n = 4(-3)^{n-1}$

A) Find the common ratio

B) Find the first 3 terms

19) 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.

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?

20) Given the following information:  $a_n = -6n + 3$

A) Find the common difference

B) Find the first 3 terms