Math 3206
Test – Chapter 1
SCO's: C4, C5, C6, C7, C21

Name:_____

Directions: Do all questions on this paper. Be sure to show all workings as full marks will not be given for incomplete answers.

Part 1: Multiple Choice **{26 marks}**

1. Which equation below would generate the given sequence: {1, 8, 27, 64, 125, . . .}?

   A) $t_n = n$ B) $t_n = n^2$
   C) $t_n = n^3$ D) $t_n = n^4$

2. The 7th Fibonacci number is 13 and the 8th Fibonacci number is 21. What is the 9th Fibonacci number?

   A) 8 B) 29 C) 30 D) 34

3. What is the next number in the given sequence: {4, 7, 10, 13, . . .}?

   A) 14 B) 16 C) 23 D) 26

4. What level of common difference will prove that a relationship is cubic?

   A) D_1 B) D_2 C) D_3 D) D_4

5. What are the first 5 terms of a sequence defined by: $t_n = 2n^2 + 1$?

   A) {3, 5, 7, 9, 11} B) {3, 9, 19, 33, 51}
   C) {5, 9, 13, 17, 21 19, 33} D) {5, 17, 37, 65, 101}

6. What type of sequence is $\{-1, -3, -5, -7, \ldots\}$?

   A) cubic B) geometric
   C) linear D) quadratic

7. The first term of a sequence is 4. Each succeeding term is created by multiplying the previous term by -2. Write the first 4 terms of the sequence.

   A) $\{-8, 16, -32\}$ B) $\{-8, -16, -32\}$
   C) $\{8, 32, 64\}$ D) $\{2, 0, -2\}$

8. If $t_n = 3n^2 - 4$, what is t_6?

   A) 6 B) 14 C) 104 D) 320

9. What is the common difference of the following sequence: $\{1, 5, 11, 17, 23, \ldots\}$?

   A) -1 B) 0 C) 4 D) 6

10. Determine t_5 if $t_n = 2^n + n^2$.

    A) 20 B) 35 C) 57 D) 127

11. Which of the following sequences is geometric?

A) $2, 4, 6, 8, \ldots$ B) $2, 3, 5, 8, \ldots$ C) $1, 2, 4, 8, \ldots$ D) $1, 8, 27, 81, \ldots$

12. What is each item in a sequence called?

A) common difference B) degree
C) rule D) term

13. The equation of an arithmetic sequence is given by $t_n = 4n + 6$. What is the value of D_1?

A) 2 B) 4 C) 6 D) 10

Part II

1. Identify each of the following sequences as arithmetic, quadratic, cubic or neither.
{12 marks}

A) $4, 5, 10, 19, 32, 49, 70, \ldots$

B) $2, -1, -4, -7, -10, -13, \ldots$

C) $2, 15, 52, 125, 246, 427, 680, \ldots$

2. List the first 4 terms of each sequence manually. You may use your calculator for part c.
{10 marks}

A) $t_n = 4n^2 + 2n - 1$

B) $t_n = 3 - 5n$

C) $t_n = 2^n + n^3$

3. For each sequence below:
   A) identify the type by using a sequence of differences
   B) if the sequence is arithmetic find the equation of the nth term by using the formula $t_n = t_1 + d(n-1)$.
   C) if the sequence is quadratic or cubic find the equation of the nth term using your TI-83.
   D) use your equation to find t_{20}.

{18 marks}

A) $0, 5, 19, 41, 71, 109, \ldots$

Type:_____ Equation_____ t_{20} = _____

B) $2, -1, -4, -7, -10, \ldots$

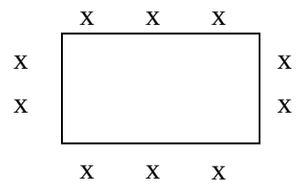
Type:_____ Equation_____ t_{20} = _____

C) $-4, -2, 8, 32, 76, 146, \ldots$

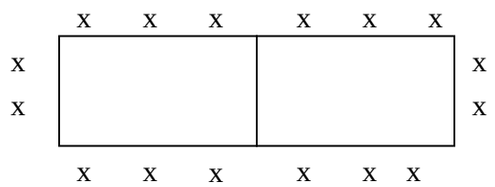
Type:_____ Equation_____ t_{20} = _____

4. Describe 3 differences between and arithmetic and a quadratic sequence. Answer in terms of common differences, graphs and equations. **{6 marks}**

5. In a school cafeteria, 10 people can sit together at one rectangular table.



When two tables are pushed together, end to end, 16 people can sit together.



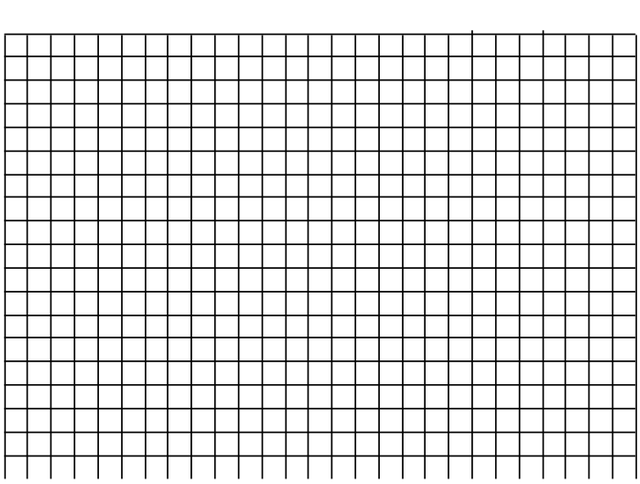
A) Draw a diagram to show how many people can sit together when 3 tables are pushed together end to end. **{1 marks}**

B) Using this pattern complete the following table. **{3 marks}**

Number of Tables (n)	1	2	3	4	5
Number of People who can sit together (t_n)					

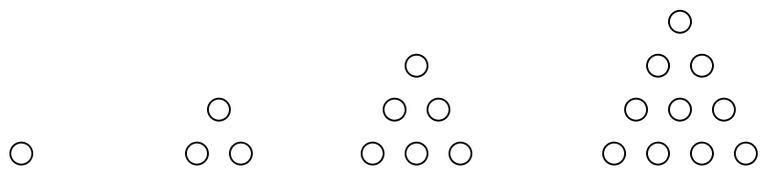
C) Using the appropriate test, determine what type of sequence is formed. **{2 marks}**

D) Plot a graph of this sequence on the grid below. Label the axis correctly. **{3 marks}**



E) Use a formula to find the equation of the nth term for this sequence. **{3 marks}**

6. Study the figures below that are constructed using a series of dots. The first four patterns are shown.



A) Write the first 6 terms of this sequence. **{3 marks}**

B) Using the appropriate testm determine what type of sequence is formed. **{3 marks}**

C) Using your calulator to determine an equation for the nth term of the sequence. **{2 marks}**

D) Use your equation, determine how many dots would be in the 16^{th} diagram. **{1 mark}**

7. Wrtie the first five members of the sequence which has the following properties: **{7 marks}**

A) $t_3 = 15,$ and $d_1 = -4$

B) $t_1 = 10$ and $d_2 = 5$
(This is a quadratic sequence. . . work backwards….there are many possible answers.)