Name: _____ Group Members: _____

Exploration 14-1a: Introduction to Sequences

Date: _____

Objective: Find a pattern in a sequence of numbers, and use the pattern to find other terms in the sequence.

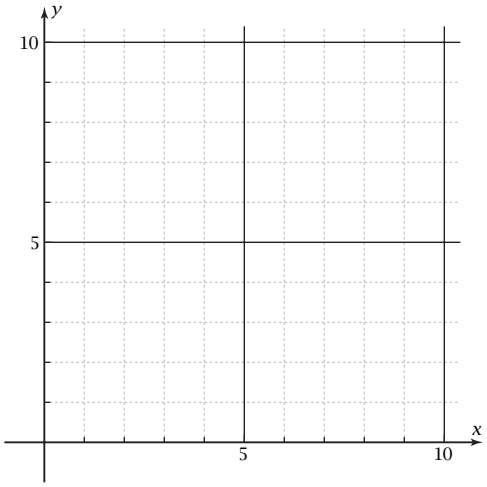
1. The following numbers are the first few **terms** of a **sequence.**

   2, 6, 12, 20, 30, 42, . . .

   What are the next two terms? How did you calculate them?

2. The symbol for the first term of the series is t_1, the second term is t_2, and so forth. What does t_5 equal? What does t_{10} equal?

3. Let n be the **term number.** The term number is the same as the subscript in the symbol for the term. It shows the order of the term in the sequence. On this graph paper, plot a graph of t_n as a function of n.



4. What is the major difference between the graph you plotted in Problem 4 and other graphs you have plotted in precalculus?

5. Write the term numbers underneath the corresponding term.

   t_n: 2, 6, 12, 20, 30, 42, . . .

   n:

6. What operation could you do to 6 to get t_6 for the answer? In general, what operation could you do to n to get t_n for the answer? Write a formula for t_n in terms of n.

7. Enter your formula from Problem 6 into your grapher as y_1. Then make a table of values of t_n, starting at t_1. Do all of the values correspond to the given ones? If not, go back and fix your formula.

8. Use your formula to calculate t_{1234}.

9. The number 11,340,056 is a term in this sequence. Write an equation stating that t_n equals this number for some n. Then solve the equation to find out what n equals.

10. What did you learn as a result of doing this Exploration that you did not know before?