

Lesson 3.1.1: Intro to Patterns

Targets:

1. I can find write a rule for a given sequence.
2. I can use a rule for a sequence to find a given term number.

Warm Up: 2, 4, 6, 8 ...

- 1.) What is the pattern?
- 2.) What is the next term?
- 3.) Make a table and find the 10th term.
- 4.) Write an equation that will help find the 100th term.

Term #	Term
1	2
2	4
3	6
4	8
5	
6	
7	
8	
9	
10	

- 5.) What is the 100th term?

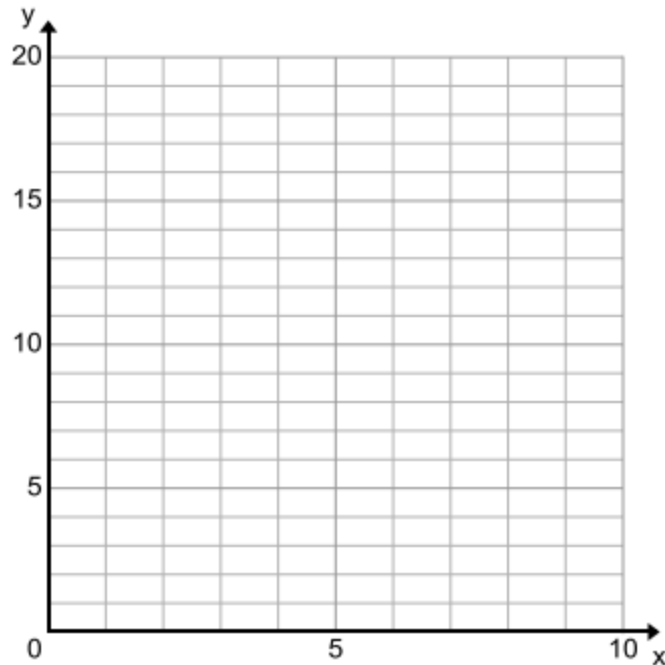
Introduction to Patterns: 1, 2, 4, 8, 16, 32

1. Can you find the pattern?
2. Can you write a rule/equation for the n^{th} term in this sequence?
3. Can you find the 23rd term?
4. Watch the "Intro to Patterns" video to get an introduction to some new ideas that we will use for Unit 3.1. Take notes on the new ideas.

Practice 1: Graphing Sequences

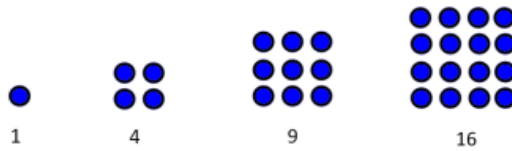
Consider the sequence that follows a “plus 3” pattern: 4, 7, 10, 13, 16,....

- 1.) Write a formula for the sequence using both the a_n notation and the $f(n)$ notation starting with $n = 1$.
- 2.) Now write a formula for the sequence in function notation starting with $n = 0$. Why might some people prefer this formula?
- 3.) Graph the terms of the sequence as ordered pairs $(n, f(n))$ on the coordinate plane. Use the formula you found in part 1. What do you notice about the graph?



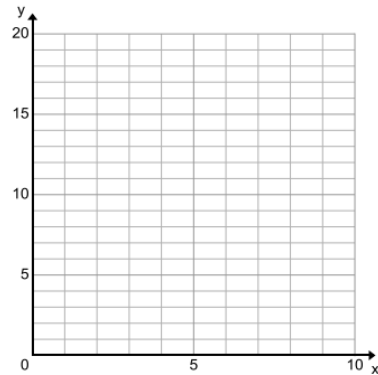
Practice 2: Visual Patterns

Here is a geometric pattern:



1.) Make a table to represent this pattern.

2.) Make a graph that represents the pattern.



3.) Use the table or graph to help write an equation for the sequence.

4.) Find the 34th term using either the table, equation, or graph.

Practice 3

Consider a sequence that follows a “minus 5” pattern: 30, 25, 20, 15,

1.) Write a formula for the n th term of the sequence. Be sure to specify what value of n your formula starts with. (Starting with the graph might help you write the formula)

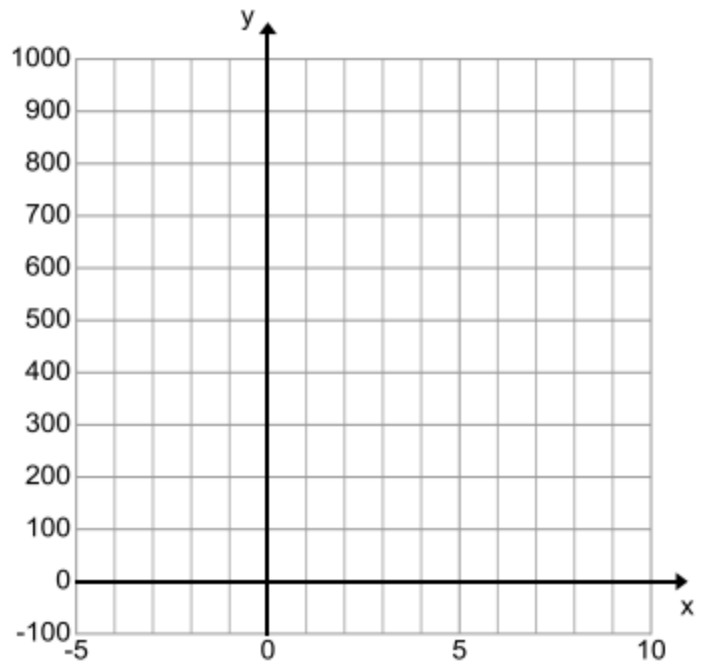
2.) Using the formula, find the 20th term of the sequence.

3.) Graph the terms of the sequence as ordered pairs $(n, f(n))$ on a coordinate plane.

Practice 4

Consider a sequence that follows a “times 5” pattern: 1, 5, 25, 125,

- 1.) Write a formula for the n th term of the sequence. Be sure to specify what value of n your formula starts with.
- 2.) Using the formula, find the 10th term of the sequence.
- 3.) Graph the terms of the sequence as ordered pairs $(n, f(n))$ on a coordinate plane.



Exit Ticket

- 1.) Consider the sequence given by a “plus 8” pattern: 2, 10, 18, 26,
Shae says that the formula for the sequence is $f(n) = 8n + 2$. Marcus tells Shae that she is wrong because the formula for the sequence is $f(n) = 8n - 6$.
 - a.) Which formula generates the sequence by starting at $n = 1$? At $n = 0$?
 - b.) Find the 100th term in the sequence.
- 2.) Write a formula for the sequence of cube numbers: 1, 8, 27, 64,