

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_ Score: \_\_\_\_\_

### Unit 2 Day 3 – Explicit Formulas for Sequences Classwork

Term #	1	2	3	4	5	6	150
Value	3	5	7	9	11		

1.a) What is the pattern of this sequence?

b) What is the first term?

c) Find the 150<sup>th</sup> term:

2. Often it is simple to see the pattern in an arithmetic sequence, and writing a recursive formula involves just filling in the starting point and the pattern. Although recursive formulas are simple to write, they are not useful when we want to find a term that is very far away from the starting point. Fill in the table to discover a formula that will help you jump to any term in a sequence.

Term	Value	Pattern	More Efficient Pattern
1	3	3	
2	5	3 + 2	
3	7	3 + 2 + 2	
4	9		3 + 2(3)
5	11		
6			
7			
150			
x			

Did you come up with a pattern to help you find the x<sup>th</sup> term? This rule is called the Explicit Formula. Write the general **Explicit Formula for an Arithmetic Sequence** here:

3. An explicit formula is a tool you can use to find the value of any term. Use your formula to find the 218<sup>th</sup> term for the sequence from #1 above:

4. a) Write an explicit formula for this sequence: -11, -3, 5, 13, 21, ...

b) Use your formula to find the 739<sup>th</sup> term:

5. How is the explicit formula like the recursive formula for arithmetic sequences?

6. How is the explicit formula different from the recursive formula for arithmetic sequences?

Term #	1	2	3	4	5	6	24
Value	3	6	12	24	48	96	

- 7 a) What is the pattern?  
 b) What is the first term?  
 c) Find the 24<sup>th</sup> term:

8. Explicit formulas for geometric sequences are different than the explicit formula for arithmetic sequences. Fill in the table to discover the explicit formula for geometric sequences.

Term	Value	Pattern	More Efficient Pattern
1	3	3	
2	6	$3 \cdot 2$	
3	12	$3 \cdot 2 \cdot 2$	
4	24		$3 \cdot 2^3$
5	48		
6	96		
7			
24			
x			

Did you come up with a pattern to help you find the  $x^{\text{th}}$  term? This rule is called the Explicit Formula. Write the general **Explicit Formula for a Geometric Sequence** here:

9. a) Write an explicit formula for this sequence: 7, 14, 28, 56, 112, 224, ...  
 b) Use your explicit formula to find the 35<sup>th</sup> term.

10. How is the explicit formula like the recursive formula for geometric sequences?

11. How is the explicit formula for geometric sequences different from the explicit formula for arithmetic sequences?