Name:_____ Math _____, Period _____

Mr. Rogove Date: _____

LEARNING OBJECTIVE:

We will write sequences with explicit and recursive formulas. (Alg1M3L2)

ACTIVATING PRIOR KNOWLEDGE

We can identify the next terms in a sequence

Identify the next 3 terms: 3, 6, 9, 12, …	Identify the next 3 terms: 830, 83, 8.3, 0.83, …
15, 18, 21	.083, .0083, .00083
What does this sequence do? Adds 3	What does this sequence do? Multiplies by $\frac{1}{10}$ (divides by 10)

$A(n) = 3 + 3(n-1)$

CONCEPT DEVELOPMENT

Let's look at the following sequence: 7, 11, 15, 19, 23,…

Next 3 numbers?? 27, 31, 35

n	A(n)	
1	7	$7+4\cdot0$
2	$11 = 7+4$	$7+4\cdot1$
3	$15 = 7+4+4$	$7+4\cdot2$
4	$19 = 7+4+4+4$	$7+4\cdot3$
5	$23 = 7+4+4+4+4$	$7+4\cdot4$

A(2) = A(1)+4

A(3) = A(2)+4

$f(1) = 7$

$A(n) = 7 + 4(n-1)$

$f(n) = 7 + 4(n-1)$

$a_n = 7 + 4(n-1)$

Explicit Formula: This specifies the n[th] term of a sequence as an expression in *n*.

Example: $A(n) = 7 + 4(n-1)$

Recursive Formula: This specifies the nth term of a sequence as an expression in the previous term or previous couple of terms.

Example: $A(n+1) = A(n) + 4$, when $A(1) = 7$ and $A(n) \geq 1$ $n \geq 1$

Same as $A(n) = A(n-1) + 4$, when $A(1) = 7$ and $A(n) \geq 1$ $n \geq 1$

The next term in the sequence = The current term in the sequence + The change from one term to the next.

Name:_____ Math _____, Period _____

Mr. Rogove Date: _____

GUIDED PRACTICE

Steps for Writing Sequences with Explicit and Recursive Formulas

1. Look at the sequence given, and identify the pattern.
2. If possible, express your sequence in correct notation as an explicit formula.
3. If possible, express your sequence in correct notation as a recursive formula.
4. Use your formulas to answer questions.

Sequence: 12, 14, 16, 18, 20,... Adds 2 $A(1)=12$ Explicit Formula: $A(n)=12+2(n-1)$ Recursive Formula: $A(n+1)=A(n)+2,\ n\geq 1$ $A(1)=12$	Sequence: $6, 2, -2, -6, -10, \ldots$ Subtract 4, $A(1)=6$ Explicit Formula: $A(n)=6-4(n-1)$ Recursive Formula: $A(n+1)=A(n)-4,\ A(1)=6$ $n\geq 1$
Sequence: $\frac{1}{2},\frac{1}{3},\frac{1}{4},\frac{1}{5},\frac{1}{6},\frac{1}{7}$ Denominator adds 1 Explicit Formula: $a_n=\frac{1}{n+1}$ Recursive Formula: $a_{n+1}=\frac{1}{(a_n)^{-1}+1}$	Sequence: $\frac{1}{2},\frac{1}{4},\frac{1}{6},\frac{1}{8},\ldots$ Explicit Formula: $a_n=\frac{1}{2n}$ Recursive Formula: $a_{n+1}=\frac{1}{(a_n)^{-1}+2}$ 1 $\frac{1}{2}$ 2 $\frac{1}{4}$ 3 $\frac{1}{6}$ n $\frac{1}{2n}$
Formula: $a_n=2n+10$ for $n\geq 1$ What are the first 5 terms in the sequence? 12, 14, 16, 18, 20 Write a recursive formula: $a_{n+1}=a_n+2,\ n\geq 1$ $a_1=12$	Formula: $a_n=\left(\frac{1}{2}\right)^{n-1}$ What are the first 5 terms in the sequence? $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$ Write a recursive formula: $a_{n+1}=\frac{a_n}{2}$ $n\geq 1$ $a_1=1$
Independent PRACTICE: KHAN ACADEMY: Evaluate Sequences in Recursive Form	

Name:_____ Math _____, Period _____

Mr. Rogove Date: _____

INDEPENDENT PRACTICE

Students complete Khan Academy exercise: Evaluate Sequences in Recursive Form.

HW: Practice Set Lesson 2, Mod 3

CLOSURE

NOTES

Mod 3, Lesson 2.

Recursive Sequence: A recursive sequence is defined by specifying the values of one or more initial terms and has the property that the remaining terms satisfy a recursive formula that describes the value of the term based upon an expression in numbers, previous terms, or the index of the term.
Example: