Name: _____   Class Period: _____

First Semester Day 6 Review: Arithmetic Sequences

Guided Notes

Arithmetic Sequences

<u>Definitions</u>

◇ An <u>Ordered</u> list of number is called a sequence.

◇ The <u>number</u> in a sequence are terms.

◇ An <u>arithmetic</u> sequence is a sequence in which the difference between terms is <u>constant</u>.

◇ The difference between <u>consecutive</u> terms in an arithmetic sequence is called the <u>common</u> <u>difference</u>.

<u>Explicit Formula</u>

Two pieces of information is needed to write an explicit formula for an arithmetic sequence:

　　◇ First term (a_1)

　　◇ Common difference (d)

Enter this information for the appropriate values in the following formula: $$a_n = a_1 + (n-1)d$$

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Example 1

Write the following numbers as a sequence: 1, -1, 5, 3, 2. Is this an arithmetic sequence? Explain your reasoning.

Sequence -1, 1, 2, 3, 5

NO, there is no common difference

Example 2

Write the following numbers as a sequence and write the common difference: 1, 5, 7, 9, 3.

Sequence 1, 3, 5, 7, 9   Common difference = 2

Example 3

Identify the following values.

$a_1 =$ 1

$a_2 =$ 3

$a_3 =$ 5

$a_4 =$ 7

$a_5 =$ 9

$d =$ 2

Example 4

Write the explicit formula for the sequence.

$$a_n = a_1 + (n-1)d = 1 + (n-1)2 = 1 + 2n - 2 = 2n - 1$$

Example 5
Rewrite the explicit formula using function notation and let the function be called $f(n)$.

$$f(n) = 2n - 1$$

Example 6
Use the explicit formula or function to evaluate $f(10)$.

$$f(10) = 2(10) - 1 = 20 - 1 = 19$$

Classwork

Problem 1

Write the following numbers as a sequence: 72, 4, 21, 7, 0. Is this an arithmetic sequence? Explain your reasoning.

Sequence 0, 4, 7, 21, 72
No, there is no common difference

Problem 2

Write the following numbers as a sequence and write the common difference: 15, 5, 20, 10.

Sequence 5, 10, 15, 20
common difference = 5

Problem 3

Identify the following values.

$a_1 = 5$

$a_2 = 10$

$a_3 = 15$

$a_4 = 20$

$d = 5$

Problem 4

Write the explicit formula for the sequence.

$$a_n = a_1 + (n-1)d = 5 + (n-1)5 = 5 + 5n - 5 = 5n$$

Problem 5

Rewrite the explicit formula using function notation and let the function be called $f(n)$.

$$f(n) = 5n$$

Problem 6

Use the explicit formula or function to evaluate $f(8)$.

$$f(8) = 5(8) = 40$$