Algebra 2B Notes

Name: _____

9-2 Arithmetic Sequences

Date: _____ Hr: _____

Objective:

- To define, identify, and apply arithmetic sequences

Common Core Content Standard:

F.1F.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

A _____ is an ordered list of numbers.

An _____ sequence is a sequence where the difference between consecutive terms is constant. The difference is the _____ difference.

Take Note

Key Concept Arithmetic Sequence

An arithmetic sequence with a starting value a and common difference d is a sequence of the form

$$a, a + d, a + 2d, a + 3d, \ldots .$$

A recursive definition for this sequence has two parts:

$a_1 = a$ initial condition

$a_n = a_{n-1} + d$, for $n > 1$ recursive formula

An explicit definition for this sequence is a single formula:

$a_n = a + (n - 1)d$, for $n \geq 1$

Example 1: Identifying Arithmetic Sequences

Is the sequence an arithmetic sequence?

a. 12, 22, 32, 42, 52, ...

b. 1, 1, 2, 3, 5, ...

Example 2: **Analyzing Arithmetic Sequences**

What are the indicated terms of the arithmetic sequence?

a. the 110^{th} term of the sequence that begins 5, 9, ...

b. *the second and third terms of the sequence 90, ?, ?, 12, ...*

The _____, or average, of the two numbers x and y is $\frac{x+y}{2}$. In an arithmetic sequence, the middle term of any three consecutive terms is the arithmetic mean of the other two terms.

Example 3: **Using the Arithmetic Mean**

What is the missing term of the arithmetic sequence ...35, ?, 53, ...?

Example 4: **Using an Explicit Formula for an Arithmetic Sequence**

Over the last ten years the amount of snow a town received formed an arithmetic sequence. If 21 in. of snow fell 10 years ago and 19 in. fell 9 years ago, how many inches fell 2 years ago?