11.2: Artihmetic Sequences

Supplementary Notes

An *arithmatic* sequence $\{a_n\}$ may be defined *recursively* as

$$a_1 = a \text{ for real number } a,$$
$$a_n = a_{n-1} + d \text{ for } n \geq 2$$

or *explicitly* as

$$a_n = a_1 + (n-1)d \text{ for } n \geq 1$$

where d is a real number called the *common difference*.

The sum S_n of the first n terms of an arithmetic sequence $\{a_n\}$ with common difference d is

$$S_n = \sum_{k=1}^{n} a_k = \frac{n}{2}(a_1 + a_n).$$

Exercises

1. Given the arithmetic sequence with $a_{21} = 65$ and $a_{36} = 110$, find the common difference.

2. Given an arithmetic sequence with $a_{26} = 80$ and $a_{41} = 125$, find the term a_{10}.

3. Find the nth term of an arithmetic sequence with first term $a_1 = 1$ and common difference $d = \frac{1}{3}$.

4. Find the sum $(-7) + (-4) + (-1) + \cdots + 128$.

5. Find the sum of all even integers between 18 nad 482 inclusive.