Chapter 4.3: Sums of Arithmetic Series

Warm Up: Write the explicit formula for the arithmetic sequence that has terms $a_4 = 22$ and $a_8 = 46$. Then find the 25th term in the sequence.

What is the SUM of the first 25 terms in the sequence?

Sequence VS Series
**Sigma Notation**

\[ \sum_{n=#}^{#} a_n \]

Example) Evaluate the series.

\[ \sum_{n=1}^{4} 3n^2 + 5 \]

Example) Consider the previous example. How would I write the sum of the first 25 terms of the series in sigma notation?

Example) Consider the arithmetic series below.

\[ 1 + 2 + 3 + 4 + 5 + 6 \]

1. Write the series in sigma notation.

2. Find the sum of the arithmetic series.
Example ) What if I extended the series?

\[ 1 + 2 + 3 + 4 + 5 + 6 + \ldots + 148 + 149 + 150 \]

1. Write the series in sigma notation.

2. Find the sum of the arithmetic series.

Finding the SUM of a FINITE ARITHMETIC SEQUENCE

\[ \text{Sum} = S_n = a_1 + a_2 + a_3 + a_4 + \ldots + a_n \]
Examples)

1.) \( If \quad a_n = 5n + 3, \quad evaluate \quad \sum_{n=1}^{26} a_n. \)

2.) \( Evaluate \quad \sum_{n=4}^{72} 3n + 2 \)

3.) \( If \quad a_k = 8 + 3(k - 1), \quad evaluate \quad \sum_{k=1}^{73} a_k. \)

If in an arithmetic sequence \( p_4 = 9 \) and \( p_7 = 15 \), answer the following questions.

1] Write the explicit formula for the sequence.

2] Evaluate \( p_{76} \)

3] Evaluate \( S_{76} \)

4] Evaluate \( \sum_{i=1}^{132} p_i \)
Classwork/Homework:

Problem Set 4.3