

### **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?

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## 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?

$$1 + 2 + 3 + 4 + 5 + 6 + \dots + 148 + 149 + 150$$

1. Write the series in sigma notation.
2. Find the sum of the arithmetic series.



**Finding the SUM of a FINITE ARITHMETIC SEQUENCE**

$$\text{Sum} = S_n = a_1 + a_2 + a_3 + a_4 + \dots + a_n$$



Examples)

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

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

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



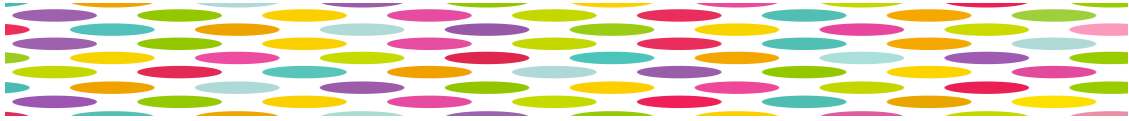
If in an arithmetic sequence  $p_4 = 9$  and  $p_7 = 15$ , answer the following questions.

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