

Section 9.4 Arithmetic Series

series: the indicated sum of the terms of a sequence

finite series: has a first and a last term

infinite series: continues without end

Arithmetic series: a series whose terms form an arithmetic sequence

$$a_1 + a_2 + a_3 + \dots + a_n \text{ finite arithmetic series}$$

Sum of a Finite Arithmetic Series

$$S_n =$$

$$1 + 3 + 5 + 7 + 9$$

Problem 1:

What is the sum of the finite arithmetic series
 $14 + 17 + 20 + 23 + \dots + 116$?

Problem 2:

There are 30 rows of seats in a large arena. The first row contains 10 seats. Each successive row increases by 3 seats. How many seats are in the last row? How many seats are there in all?

Summation notation

\sum Sigma Limits: the least and greatest values of n in the series

$$3^2 + 4^2 + 5^2 + \dots + 108^2$$

$$= \sum$$

Problem 3:

What is the summation notation for the series?

a. $-19 + -14 + -9 + \dots + 221 + 226$

b. $20 + 18 + 16 + \dots + -24 + -26$

Problem 4:

What is the sum of the series written in summation notation?

a. $\sum_{n=1}^{27} (-2n + 1)$

b. $\sum_{n=1}^5 (n^2 + 5)$

c. $\sum_{n=0}^5 (10^n)$

Problem 5:

What is the sum of the series written in summation notation?

$$\sum_{n=1}^{85} (n^2 + 4n + 3)$$