1.2 Arithmetic Series

An **arithmetic series** is a sum of terms that form an arithmetic sequence

S_n represents the sum of the first *n* terms of a series.

Example 1:

2, 5, 8, 11 is an arithmetic sequence

2+5+8+11 is an arithmetic series

$S_4 =$ is the sum of the first four terms of the series

The general *sum* of an arithmetic series can be determined by:

$$\boldsymbol{S_n = \frac{n}{2}[2t_1 + (n-1)d]}$$

Where t_1 is the first term

n is the number of terms

d is the common difference

S_n is the sum of the first *n* terms

We can determine another form of the equation using:

$$t_n = t_1 + (n-1)d$$

$$S_n = \frac{n}{2}(t_1 + t_n)$$

In this equation, t_n represents the *nth* term in the series (usually the *last* term in the series)

Example 2:

Determine the following:

a.) S_9 of the series 20+ 23+ 25…

b.) S_{14} of the series $-32 + (-26) + (-20) + \cdots$

Example 3:

Determine the sum of the following series:

$$11 + 14 + \cdots + 122$$

Example 4:

The sum of the first two terms of an arithmetic series is 19 and the sum of the first four terms is 50. Determine t_1, d and S_n