



**Examples:** Find the first term and common difference of the arithmetic sequence described. Give a recursive formula for the sequence, and write a formula for the  $n$ th term.

a) 4th term is 3, 20th term is 35

b) 5th term is 30, 13th term is  $-2$

### Sum of an Arithmetic Sequence

The sum  $S_n$  of the first  $n$  terms of an arithmetic sequence  $\{a_n\}$  with first term  $a_1$  and common difference  $d$  is

given by  $S_n = a_1 + a_2 + a_3 + \dots + a_n = \frac{n}{2}(a_1 + a_n)$ .

**Examples:** Find each sum.

a)  $-1 + 3 + 7 + \dots + (4n - 5)$

b)  $1 + 3 + 5 + \dots + 59$

c)  $7 + 1 - 5 - 11 - \dots - 299$

d)  $\sum_{k=1}^{90} (3 - 2k)$

e)  $\sum_{k=1}^{80} \left( \frac{k}{3} + \frac{1}{2} \right)$

**Example:** The corner section of a football stadium has 15 seats in the first row and 40 rows in all. Each successive row contains two additional seats. How many seats are in this section?