Practice Exercises

A. Find the sum of each arithmetic sequence.

1. 2, 5, 8,... to 8 terms
2. -11, -7, -3,... to 23 terms
3. Sum of odd integers from 1 to 100
4. Sum of the integers between 50 and 200 which are divisible by 5

B. In each arithmetic series, find the specified unknown.

1. $S_n = 90$, $a_1=10$, $a_n=26$, $n=?$
2. $S_n = 1{,}800$, $a_n=185$, $n=18$, $a_1=?$
3. $S_n = 119$, $a_1=5$, $d=4$, $n=?$
4. $a_{10} = 27.5$, $d=3$, $a_1=?$, $S_n=?$

Problem Set

A. Find the sum of each arithmetic sequence.

1. 3, 5, 7,... to 31 terms
2. 10, -2, -14,... to 17 terms
3. Sum of even integers from 10 to 90
4. Sum of the integers between 2 and 100 which are divisible by 3

B. In each arithmetic series, find the specified unknown.

1. $S_n = 50$, $a_1=4$, $a_n=16$, n=?
2. $S_n = -15$, $a_1=12$, $d=-3$, n=?
3. Sum of even integers between 20 and 80

Problem Set

A.

1. $a_1 = 3, d = 5 - 3 = 2,$

$n = 31, S_{31} = ?$

$S_n = \frac{n}{2}[2a_1 + (n-1)d]$

$S_{31} = \frac{31}{2}[2(3) + (31-1)(2)]$

$S_{31} = \frac{31}{2}(66)$

$S_{31} = 1,023$

2. $a_1 = 10, d = -2 - 10 = -12,$

$n = 17, S_{17} = ?$

$S_n = \frac{n}{2}[2a_1 + (n-1)d]$

$S_{17} = \frac{17}{2}[2(10) + (17-1)(-12)]$

$S_{17} = \frac{17}{2}[20 + (17-1)(-12)]$

$S_{17} = \frac{17}{2}(-172)$

$S_{17} = 1,462$

3. $a_1 = 10, d = 12 - 10 = 2, a_n = 90, S_n = ?$

$n = \frac{a_n - a_1}{d} + 1$

$$n = \frac{99-3}{3} + 1$$

$$n = 41$$

$$S_n = \frac{n}{2}[2a_1 + (n-1)d]$$

$$S_{41} = \frac{41}{2}[2(10) + (41-1)(2)]$$

$$S_{41} = \frac{41}{2}(100)$$

$$S_{41} = 2,050$$

$a_n = 99, S_n = ?$

$$n = \frac{a_n - a_1}{d} + 1$$

$$n = \frac{99-3}{3} + 1$$

$$n = 33$$

$$S_n = \frac{n}{2}[2a_1 + (n-1)d]$$

$$S_{33} = \frac{33}{2}[2(3) + (33-1)(3)]$$

$$S_{33} = \frac{33}{2}(102)$$

$$S_{33} = 1,683$$

4. $a_1 = 3, d = 6-3 = 3,$

B.

1. $S_n = \frac{n}{2}(a_1 + a_n)$

$$50 = \frac{n}{2}(4+16)$$

$$\frac{50}{10} = \frac{10n}{10}$$
$$n = 5$$

3. $S_n = \frac{n}{2}[2a_1 + (n-1)d]$

$$-15 = \frac{n}{2}[2(12) + (n-1)(-3)]$$
$$-15 = \frac{n}{2}(24 - 3n + 3)$$
$$2\left[-15 = \frac{n}{2}(-3n + 27)\right]$$
$$-30 = n(-3n + 27)$$
$$-30 = -3n^2 + 27n$$
$$0 = -3n^2 + 27n + 30$$
$$0 = -3(n - 10)(n + 1)$$
$$n - 10 = 0$$
$$n = 10$$

4. $a_1 = 22,\ a_n = 78,$

$$d = 24 - 22 = 2, n = ?,\ S_n = ?$$
$$n = \frac{a_n - a_1}{d} + 1$$
$$n = \frac{78 - 22}{2} + 1$$
$$n = 29$$
$$S_n = \frac{n}{2}(a_1 + a_n)$$
$$S_{29} = \frac{29}{2}(22 + 78)$$
$$S_{29} = 1,450$$