

Pg 667

(27) 5, 3, 1, -1, -3, ...

This sequence is arithmetic.

The common difference is -2.

$$a_n = 5 - 2(n-1) \\ = 7 - 2n$$

(28) 0, 1, 3, 6, 10, ...

This sequence is not arithmetic.

(29) $\frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, \dots$

This sequence is arithmetic.

The common difference is $\frac{1}{2}$.

$$a_n = \frac{1}{2} + \frac{1}{2}(n-1) \\ = \frac{1}{2}n$$

(30) $\frac{9}{9}, \frac{8}{9}, \frac{7}{9}, \frac{6}{9}, \frac{5}{9}, \dots$

This sequence is arithmetic.

The common difference is $-\frac{1}{9}$.

$$a_n = \frac{9}{9} - \frac{1}{9}(n-1) \\ = \frac{10}{9} - \frac{1}{9}n$$

$$\textcircled{35} \quad a_1 = 7, d = 12$$

$$a_n = 7 + 12(n-1) = 12n - 5$$

$$\textcircled{39} \quad a_2 = 93, a_6 = 65$$

$$93, \quad \text{---}, \quad \text{---}, \quad \text{---}, \quad 65$$

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+d +d +d +d

$$4d = 65 - 93$$

$$4d = -28$$

$$d = -7$$

$$a_1 = a_2 - d = 93 - (-7) = 100$$

$$a_n = 100 - 7(n-1)$$

$$= 107 - 7n$$

$$\textcircled{42} \quad \sum_{j=1}^8 (20 - 3j) = \frac{8(17 + -4)}{2} = 4(13) = 52$$

$$a_j = 20 - 3j$$

$$a_1 = 17$$

$$a_8 = -4$$

$$\textcircled{44} \quad \sum_{k=1}^{25} \left(\frac{3k+1}{4} \right) = \frac{25(1+19)}{2} = 25(10) = 250$$

$$a_k = \frac{3k+1}{4}$$

$$a_1 = 1$$

$$a_{25} = 19$$

(45) sum of first 100 positive multiples of 5
5, 10, 15, 20, ..., ?

$$a_n = 5 + 5(n-1) = 5n$$

$$a_{100} = 500$$

$$S_{100} = \sum_{n=1}^{100} 5n = \frac{100(5+500)}{2}$$

$$= 50(505) = 25250$$

(47) let A_n = accountant's salary (\$) during
the n^{th} year

$$A_1 = 34000$$

$$d = 2250$$

$$A_n = 34000 + 2250(n-1)$$
$$= 2250n + 31750$$

$$A_5 = 43000$$

$$S_5 = \sum_{n=1}^5 A_n = \frac{5(34000 + 43000)}{2}$$
$$= 192500$$

The accountant's salary during the fifth year is \$43,000. The total compensation for the accountant through 5 full years of employment is \$192,500.

④ let $B_n = \#$ of bales of hay made during the n^{th} trip

$$B_1 = 123$$

$$B_2 = 112$$

$$d = -11$$

$$B_n = 123 - 11(n-1)$$

$$= 134 - 11n$$

★ after another six trips = 8 trips ★

$$B_8 = 46$$

$$S_8 = \sum_{n=1}^8 B_n = \frac{8(123+46)}{2}$$

$$= 4(169) = 676$$

The farmer makes 676 bales of hay in the 8 trips.