



◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시
1) 제작연월일 : 2019-02-13
2) 제작자 : 교육지대(주)
3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초
제작일부터 5년간 보호됩니다.

◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호
되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무
단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법
외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

01 / Σ 의 뜻과 기본 성질

(1) Σ 의 뜻: 수열 $\{a_n\}$ 의 첫째항부터 제 n 항까지의 합을
기호 Σ 를 사용하여 나타낸다.

$$\Rightarrow a_1 + a_2 + a_3 + \cdots + a_n = \sum_{k=1}^n a_k = S_n$$

(2) Σ 의 기본 성질

$$\textcircled{1} \sum_{k=1}^n (a_k + b_k) = \sum_{k=1}^n a_k + \sum_{k=1}^n b_k$$

$$\textcircled{2} \sum_{k=1}^n (a_k - b_k) = \sum_{k=1}^n a_k - \sum_{k=1}^n b_k$$

$$\textcircled{3} \sum_{k=1}^n c a_k = c \sum_{k=1}^n a_k \quad (\text{단, } c \text{는 상수})$$

$$\textcircled{4} \sum_{k=1}^n c = cn \quad (\text{단, } c \text{는 상수})$$

■ 다음을 합의 기호 Σ 를 사용하여 나타내시오.

1. $3+3+3+3+3$

2. $6+6+6+6+6+6$

3. $2+4+6+\cdots+20$

4. $1+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{n}$

5. $\frac{1}{2}+\frac{1}{4}+\frac{1}{6}+\cdots+\frac{1}{2n}$

6. $1+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{10}$

7. $2+4+8+\cdots+2^n$

8. $1+4+7+\cdots+46$

9. $1+2^2+3^2+\cdots+15^2$

10. $2+4+8+\cdots+1024$

11. $1+5+9+\cdots+45$

12. $1+4+7+\cdots+25$

13. $1+3+3^2+\cdots+3^9$

$$14. 1 \cdot 10 + 2 \cdot 9 + 3 \cdot 8 + \cdots + 10 \cdot 1$$

$$15. 3 \times 5 + 5 \times 7 + 7 \times 9 + \cdots + 49 \times 51$$

■ 다음을 합의 기호 \sum 를 사용하지 않고 나타내어라.

$$16. \sum_{k=1}^7 3^k$$

$$17. \sum_{k=5}^{12} k^2$$

$$18. \sum_{k=1}^n k^2$$

$$19. \sum_{i=1}^5 2^i$$

$$20. \sum_{k=1}^5 2k$$

$$21. \sum_{k=1}^{10} 3k$$

$$22. \sum_{k=1}^7 (2k+1)$$

$$23. \sum_{k=3}^8 \frac{1}{k(k+1)}$$

$$24. \sum_{k=3}^{10} (2k-1)(2k+1)$$

$$25. \sum_{k=4}^{10} (2k+1)$$

$$26. \sum_{k=1}^{10} (k+1)(k+2)$$

$$27. \sum_{k=1}^{10} (5k+1)$$

$$28. \sum_{k=1}^n k(k+2)$$

■ $\sum_{k=1}^{10} a_k = 3, \sum_{k=1}^{10} b_k = 2$ 일 때, 다음 식의 값을 구하여라.

29. $\sum_{k=1}^{10} (8a_k - 5b_k + 2)$

30. $\sum_{k=1}^{10} (4a_k + 3b_k - 2)$

31. $\sum_{k=1}^{10} (3a_k - 4b_k)$

32. $\sum_{k=1}^{10} (a_k + b_k)$

■ $\sum_{k=1}^{10} a_k^2 = 7, \sum_{k=1}^{10} a_k = 3$ 일 때, 다음 식의 값을 구하여라.

33. $\sum_{k=1}^{10} (2a_k - 1)^2$

34. $\sum_{k=1}^{10} (a_k - 3)^2$

35. $\sum_{k=1}^{10} (3a_k^2 + a_k - 4)$

36. $\sum_{k=1}^{10} (a_k^2 - 2a_k)$

■ $\sum_{k=1}^{10} a_k^2 = 6, \sum_{k=1}^{10} a_k = 3$ 일 때, 다음 식의 값을 구하여라.

37. $\sum_{k=1}^{10} (3a_k - 2)^2$

38. $\sum_{k=1}^{10} (a_k + 2)^2$

39. $\sum_{k=1}^{10} (3a_k^2 - 2a_k + 1)$

40. $\sum_{k=1}^{10} (a_k^2 + 3a_k)$

■ $\sum_{k=1}^{10} a_k^2 = 4, \sum_{k=1}^{10} a_k = 2$ 일 때, 다음을 구하여라.

41. $\sum_{k=1}^{10} (3a_k - 2)^2$

42. $\sum_{k=1}^{10} (a_k - 2)^2$

43. $\sum_{k=1}^{10} (a_k + 1)^2$

▣ $\sum_{k=1}^{10} a_k = 100, \sum_{k=1}^{10} b_k = 50$ 일 때, 다음을 구하여라.

44. $\sum_{k=1}^{10} (a_k - 2b_k + 2)$

45. $\sum_{k=1}^{10} (a_k + b_k)$

▣ 다음 식의 값을 구하여라.

46. $\sum_{k=1}^{15} a_k = 40, \sum_{k=1}^{20} a_k = 55$ 일 때, $\sum_{k=16}^{20} a_k$

47. $\sum_{k=1}^{10} a_k = 2$ 일 때, $\sum_{k=1}^{10} (5a_k + 2)$

48. $\sum_{k=1}^{10} a_k = 2, \sum_{k=1}^{10} b_k = 3$ 일 때, $\sum_{k=1}^{10} (2a_k + 3b_k)$

49. $\sum_{k=1}^{10} a_k = 12, \sum_{k=1}^{10} b_k = 7$ 일 때, $\sum_{k=1}^{10} (4a_k - 3b_k + 2)$

50. $\sum_{k=1}^{10} a_k = 10, \sum_{k=1}^{20} a_k = 30$ 일 때, $\sum_{k=11}^{20} a_k$

51. $\sum_{k=1}^6 a_k = 6, \sum_{k=1}^6 a_k^2 = 30$ 일 때, $\sum_{k=1}^6 (2a_k - 1)^2$

52. $\sum_{k=1}^{10} a_k = 7, \sum_{k=1}^{10} a_k^2 = 15$ 일 때, $\sum_{k=1}^{10} (a_k + 2)(a_k - 1)$

53. $\sum_{k=1}^{10} (2a_k + 1) = 30, \sum_{k=1}^{10} (a_k^2 + a_k + 1) = 50$ 일 때,
 $\sum_{k=1}^{10} a_k^2$

54. $\sum_{k=1}^{10} a_k = 15, \sum_{k=1}^{10} a_k^2 = 30, \sum_{k=1}^{10} b_k = 10$ 일 때,
 $\sum_{k=1}^{10} \{(a_k + 1)^2 + b_k\}$

55. $\sum_{k=1}^{10} a_k = 30, \sum_{k=1}^{10} b_k = 40$ 일 때, $\sum_{k=1}^{10} (3a_k - b_k + 2)$

56. $\sum_{k=1}^{10} a_k = 20, \sum_{k=1}^{10} b_k = 30$ 일 때, $\sum_{k=1}^{10} (3a_k - 2b_k + 1)$

57. $\sum_{n=1}^{10} a_n = 5, \sum_{n=1}^{10} b_n = 10$ 일 때, $\sum_{n=1}^{10} (2a_n + 3b_n - 1)$

58. $\sum_{k=1}^{30} a_k = 10, \sum_{k=1}^{30} b_k = 5$ 일 때, $\sum_{k=1}^{30} (3a_k - 2b_k + 6)$

59. $\sum_{k=1}^{20} a_k = 35, \sum_{k=11}^{20} a_k = 15, \sum_{k=1}^{10} b_k = 12$ 일 때,
 $\sum_{k=1}^{10} (2a_k + 5b_k - 1)$

60. $\sum_{k=1}^7 a_k = 10, \sum_{k=1}^7 a_k^2 = 50$ 일 때, $\sum_{k=1}^7 (3a_k - 5)^2$

61. $\sum_{k=1}^n a_k = 5, \sum_{k=1}^n b_k = -2$ 일 때, $\sum_{k=1}^n (3a_k + 7b_k)$

62. $\sum_{k=1}^{10} a_k = 10, \sum_{k=1}^{10} a_k^2 = 40$ 일 때, $\sum_{k=1}^{10} (2a_k + 1)^2$

■ 다음을 구하여라.

63. $\sum_{k=1}^{20} (k^2 + 1) - \sum_{k=1}^{19} (k^2 + 1)$

64. $\sum_{k=1}^{20} k^2 - \sum_{k=3}^{20} k^2$

65. $\sum_{k=1}^{20} (k^2 + 2) - \sum_{k=1}^{20} (k^2 - 2)$



정답 및 해설

$$1) \sum_{k=1}^5 3$$

$$\Rightarrow 3이\ 5개\ 있으므로\ 3+3+3+3+3 = \sum_{k=1}^5 3$$

$$2) \sum_{k=1}^6 6$$

$$\Rightarrow 6+6+6+6+6+6 = \sum_{k=1}^6 6$$

$$3) \sum_{k=1}^{10} 2k$$

$$4) \sum_{k=1}^n \frac{1}{k}$$

$$\Rightarrow 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n} = \sum_{k=1}^n \frac{1}{k}$$

$$5) \sum_{k=1}^n \frac{1}{2k}$$

$$\Rightarrow \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots + \frac{1}{2n} = \sum_{k=1}^n \frac{1}{2k}$$

$$6) \sum_{k=1}^{10} \frac{1}{k}$$

$$7) \sum_{k=1}^n 2^k$$

$$\Rightarrow 2+4+8+\dots+2^n = \sum_{k=1}^n 2^k$$

$$8) \sum_{k=1}^{16} (3k-2)$$

$$\Rightarrow a_n = 1 + (n-1) \times 3 = 3n-2$$

$$3n-2=46 \quad \therefore n=16$$

일반항이 $a_n = 3n-2$ 이고, 첫째항부터 제16항까지의 합이므로

$$1+4+7+\dots+46 = \sum_{k=1}^{16} (3k-2)$$

$$9) \sum_{k=1}^{15} k^2$$

$$10) \sum_{k=1}^{10} 2^k$$

$$11) \sum_{k=1}^{12} (4k-3)$$

$$\Rightarrow a_n = 1 + (n-1) \times 4 = 4n-3$$

$$4n-3=45 \quad \therefore n=12$$

일반항이 $a_n = 4n-3$ 이고, 첫째항부터 제12항까지의 합이므로

$$1+5+9+\dots+45 = \sum_{k=1}^{12} (4k-3)$$

$$12) \sum_{k=1}^9 (3k-2)$$

$$\Rightarrow 1+4+7+\dots+25 = \sum_{k=1}^9 (3k-2)$$

$$13) \sum_{k=1}^{10} 3^{k-1}$$

$$\Rightarrow 1+3+3^2+\dots+3^9 = \sum_{k=1}^{10} 3^{k-1}$$

$$14) \sum_{k=1}^{10} k(11-k)$$

$$15) \sum_{k=1}^{24} (2k+1)(2k+3)$$

$$\Rightarrow a_n = (2n+1)(2n+3)$$

$$2n+1=49 \quad \therefore n=24$$

일반항이 $a_n = (2n+1)(2n+3)$ 이고, 첫째항부터 제24항까지의 합이므로

$$3 \times 5 + 5 \times 7 + 7 \times 9 + \dots + 49 \times 51$$

$$= \sum_{k=1}^{24} (2k+1)(2k+3)$$

$$16) 3+3^2+3^3+\dots+3^7$$

$$\Rightarrow \sum_{k=1}^7 3^k = 3+3^2+3^3+\dots+3^7$$

$$17) 5^2+6^2+7^2+\dots+12^2$$

$$\Rightarrow \sum_{k=5}^{12} k^2 = 5^2+6^2+7^2+\dots+12^2$$

$$18) 1^2+2^2+3^2+\dots+n^2$$

$$\Rightarrow \sum_{k=1}^n k^2 = 1^2+2^2+3^2+\dots+n^2$$

$$19) 2+4+8+16+32$$

$$\Rightarrow \sum_{i=1}^5 2^i = 2^1+2^2+2^3+2^4+2^5 \\ = 2+4+8+16+32$$

$$20) 2+4+6+8+10$$

$$\Rightarrow \sum_{k=1}^5 2k = 2 \cdot 1 + 2 \cdot 2 + 2 \cdot 3 + 2 \cdot 4 + 2 \cdot 5 \\ = 2+4+6+8+10$$

$$21) 3+6+9+\dots+30$$

$$\Rightarrow \sum_{k=1}^{10} 3k = 3 \cdot 1 + 3 \cdot 2 + 3 \cdot 3 + \dots + 3 \cdot 10$$

$$= 3 + 6 + 9 + \cdots + 30$$

$$22) 3 + 5 + 7 + \cdots + 15$$

$$\Rightarrow k = 1, 2, 3, \dots, 7 \text{ 이므로}$$

$$\sum_{k=1}^7 (2k+1) = 3 + 5 + 7 + \cdots + 15$$

$$23) \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \frac{1}{5 \cdot 6} + \cdots + \frac{1}{8 \cdot 9}$$

$$\Rightarrow \sum_{k=3}^8 \frac{1}{k(k+1)} = \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \frac{1}{5 \cdot 6} + \cdots + \frac{1}{8 \cdot 9}$$

$$24) 5 \cdot 7 + 7 \cdot 9 + 9 \cdot 11 + \cdots + 19 \cdot 21$$

$$\Rightarrow \sum_{k=3}^{10} (2k-1)(2k+1) \\ = 5 \cdot 7 + 7 \cdot 9 + 9 \cdot 11 + \cdots + 19 \cdot 21$$

$$25) 9 + 11 + 13 + \cdots + 21$$

$$\Rightarrow \sum_{k=4}^{10} (2k+1) = 9 + 11 + 13 + \cdots + 21$$

$$26) 2 \cdot 3 + 3 \cdot 4 + 4 \cdot 5 + \cdots + 11 \cdot 12$$

$$\Rightarrow \sum_{k=1}^{10} (k+1)(k+2) = 2 \cdot 3 + 3 \cdot 4 + 4 \cdot 5 + \cdots + 11 \cdot 12$$

$$27) 6 + 11 + 16 + \cdots + 51$$

$$\Rightarrow \sum_{k=1}^{10} (5k+1) = 6 + 11 + 16 + \cdots + 51$$

$$28) 1 \times 3 + 2 \times 4 + 3 \times 5 + \cdots + n(n+2)$$

$$\Rightarrow k = 1, 2, 3, \dots, n \text{ 이므로}$$

$$\sum_{k=1}^n k(k+2) = 1 \times 3 + 2 \times 4 + 3 \times 5 + \cdots + n(n+2)$$

$$29) 34$$

$$\Rightarrow \sum_{k=1}^{10} (8a_k - 5b_k + 2) = 8 \sum_{k=1}^{10} a_k - 5 \sum_{k=1}^{10} b_k + \sum_{k=1}^{10} 2 \\ = 8 \cdot 3 - 5 \cdot 2 + 2 \cdot 10 = 34$$

$$30) -2$$

$$\Rightarrow \sum_{k=1}^{10} (4a_k + 3b_k - 2) = 4 \sum_{k=1}^{10} a_k + 3 \sum_{k=1}^{10} b_k - \sum_{k=1}^{10} 2 \\ = 4 \cdot 3 + 3 \cdot 2 - 2 \cdot 10 = -2$$

$$31) 1$$

$$\Rightarrow \sum_{k=1}^{10} (3a_k - 4b_k) = 3 \sum_{k=1}^{10} a_k - 4 \sum_{k=1}^{10} b_k = 3 \cdot 3 - 4 \cdot 2 = 1$$

$$32) 5$$

$$\Rightarrow \sum_{k=1}^{10} (a_k + b_k) = \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} b_k = 3 + 2 = 5$$

$$33) 26$$

$$\Rightarrow \sum_{k=1}^{10} (2a_k - 1)^2 = \sum_{k=1}^{10} (4a_k^2 - 4a_k + 1)$$

$$= 4 \sum_{k=1}^{10} a_k^2 - 4 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1 \\ = 4 \times 7 - 4 \times 3 + 10 = 26$$

$$34) 79$$

$$\Rightarrow \sum_{k=1}^{10} (a_k - 3)^2 = \sum_{k=1}^{10} (a_k^2 - 6a_k + 9) \\ = \sum_{k=1}^{10} a_k^2 - 6 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 9 \\ = 7 - 6 \times 3 + 9 \cdot 10 = 79$$

$$35) -16$$

$$\Rightarrow \sum_{k=1}^{10} (3a_k^2 + a_k - 4) = 3 \sum_{k=1}^{10} a_k^2 + \sum_{k=1}^{10} a_k - \sum_{k=1}^{10} 4 \\ = 3 \times 7 + 3 - 4 \cdot 10 = -16$$

$$36) 1$$

$$\Rightarrow \sum_{k=1}^{10} (a_k^2 - 2a_k) = \sum_{k=1}^{10} a_k^2 - 2 \sum_{k=1}^{10} a_k \\ = 7 - 2 \times 3 = 1$$

$$37) 58$$

$$\Rightarrow \sum_{k=1}^{10} (3a_k - 2)^2 = \sum_{k=1}^{10} (9a_k^2 - 12a_k + 4) \\ = 9 \sum_{k=1}^{10} a_k^2 - 12 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 4 \\ = 9 \cdot 6 - 12 \cdot 3 + 4 \cdot 10 = 58$$

$$38) 58$$

$$\Rightarrow \sum_{k=1}^{10} (a_k + 2)^2 = \sum_{k=1}^{10} (a_k^2 + 4a_k + 4) \\ = \sum_{k=1}^{10} a_k^2 + 4 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 4 \\ = 6 + 4 \cdot 3 + 4 \cdot 10 = 58$$

$$39) 22$$

$$\Rightarrow \sum_{k=1}^{10} (3a_k^2 - 2a_k + 1) = 3 \sum_{k=1}^{10} a_k^2 - 2 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1 \\ = 3 \cdot 6 - 2 \cdot 3 + 10 = 22$$

$$40) 15$$

$$\Rightarrow \sum_{k=1}^{10} (a_k^2 + 3a_k) = \sum_{k=1}^{10} a_k^2 + 3 \sum_{k=1}^{10} a_k = 6 + 3 \cdot 3 = 15$$

$$41) 52$$

$$\Rightarrow \sum_{k=1}^{10} (3a_k - 2)^2 = \sum_{k=1}^{10} (9a_k^2 - 12a_k + 4) \\ = 9 \sum_{k=1}^{10} a_k^2 - 12 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 4 \\ = 9 \times 4 - 12 \times 2 + 4 \times 10 = 52$$

$$42) 36$$

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} (a_k - 2)^2 &= \sum_{k=1}^{10} (a_k^2 - 4a_k + 4) \\ &= \sum_{k=1}^{10} a_k^2 - 4 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 4 \\ &= 4 - 4 \times 2 + 4 \times 10 = 36\end{aligned}$$

43) 18

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} (a_k + 1)^2 &= \sum_{k=1}^{10} (a_k^2 + 2a_k + 1) \\ &= \sum_{k=1}^{10} a_k^2 + 2 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1 \\ &= 4 + 2 \times 2 + 1 \times 10 = 18\end{aligned}$$

44) 20

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} (a_k - 2b_k + 2) &= \sum_{k=1}^{10} a_k - 2 \sum_{k=1}^{10} b_k + \sum_{k=1}^{10} 2 \\ &= 100 - 2 \times 50 + 2 \times 10 = 20\end{aligned}$$

45) 150

$$\Rightarrow \sum_{k=1}^{10} (a_k + b_k) = \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} b_k = 100 + 50 = 150$$

46) 15

$$\Rightarrow \sum_{k=16}^{20} a_k = \sum_{k=1}^{20} a_k - \sum_{k=1}^{15} a_k = 55 - 40 = 15$$

47) 30

$$\Rightarrow \sum_{k=1}^{10} (5a_k + 2) = 5 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 2 = 5 \cdot 2 + 2 \cdot 10 = 30$$

48) 13

$$\Rightarrow \sum_{k=1}^{10} (2a_k + 3b_k) = 2 \sum_{k=1}^{10} a_k + 3 \sum_{k=1}^{10} b_k = 2 \cdot 2 + 3 \cdot 3 = 13$$

49) 47

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} (4a_k - 3b_k + 2) &= 4 \sum_{k=1}^{10} a_k - 3 \sum_{k=1}^0 b_k + \sum_{k=1}^{10} 2 \\ &= 4 \cdot 12 - 3 \cdot 7 + 2 \cdot 10 = 47\end{aligned}$$

50) 20

$$\Rightarrow \sum_{k=11}^{20} a_k = \sum_{k=1}^{20} a_k - \sum_{k=1}^{10} a_k = 30 - 10 = 20$$

51) 102

$$\begin{aligned}\Rightarrow \sum_{k=1}^6 (2a_k - 1)^2 &= \sum_{k=1}^6 (4a_k^2 - 4a_k + 1) \\ &= 4 \cdot 30 - 4 \cdot 6 + 6 = 102\end{aligned}$$

52) 2

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} (a_k + 2)(a_k - 1) &= \sum_{k=1}^{10} (a_k^2 + a_k - 2) \\ &= 15 + 7 - 2 \cdot 10 = 2\end{aligned}$$

53) 30

$$\Rightarrow \sum_{k=1}^{10} (2a_k + 1) = 30 \text{에서}$$

$$2 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1 = 30, \quad 2 \sum_{k=1}^{10} a_k + 10 = 30$$

$$\therefore \sum_{k=1}^{10} a_k = 10$$

$$\sum_{k=1}^{10} (a_k^2 + a_k + 1) = \sum_{k=1}^{10} a_k^2 + \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1$$

$$= \sum_{k=1}^{10} a_k^2 + 10 + 10 = \sum_{k=1}^{10} a_k^2 + 20 = 50$$

$$\therefore \sum_{k=1}^{10} a_k^2 = 30$$

54) 80

$$\begin{aligned}\Rightarrow \sum_{k=1}^{10} \{(a_k + 1)^2 + b_k\} &= \sum_{k=1}^{10} \{a_k^2 + 2a_k + 1 + b_k\} \\ &= 30 + 2 \cdot 15 + 10 + 10 = 80\end{aligned}$$

55) 70

$$\Rightarrow \sum_{k=1}^{10} (3a_k - b_k + 2) = 3 \cdot 30 - 40 + 2 \cdot 10 = 70$$

56) 10

$$\Rightarrow \sum_{k=1}^{10} (3a_k - 2b_k + 1) = 3 \cdot 20 - 2 \cdot 30 + 10 = 10$$

57) 30

$$\Rightarrow \sum_{n=1}^{10} (2a_n + 3b_n - 1) = 2 \cdot 5 + 3 \cdot 10 - 10 = 30$$

58) 200

$$\Rightarrow \sum_{k=1}^{30} (3a_k - 2b_k + 6) = 3 \cdot 10 - 2 \cdot 5 + 6 \cdot 30 = 200$$

59) 90

$$\Rightarrow \sum_{k=1}^{10} a_k = \sum_{k=1}^{20} a_k - \sum_{k=11}^{20} a_k = 35 - 15 = 20$$

$$\therefore \sum_{k=1}^{10} (2a_k + 5b_k - 1) = 2 \cdot 20 + 5 \cdot 12 - 10 = 90$$

60) 325

$$\begin{aligned}\Rightarrow \sum_{k=1}^7 (3a_k - 5)^2 &= \sum_{k=1}^7 (9a_k^2 - 30a_k + 25) \\ &= 9 \cdot 50 - 30 \cdot 10 + 25 \cdot 7 = 325\end{aligned}$$

61) 1

$$\Rightarrow \sum_{k=1}^n a_k = 5, \quad \sum_{k=1}^n b_k = -2 \text{이므로}$$

$$\sum_{k=1}^n (3a_k + 7b_k) = 3 \sum_{k=1}^n a_k + 7 \sum_{k=1}^n b_k = 15 - 14 = 1$$

62) 210

$$\Rightarrow \sum_{k=1}^{10} a_k = 10, \sum_{k=1}^{10} a_k^2 = 40 \text{ 이므로}$$

$$\begin{aligned} \sum_{k=1}^{10} (2a_k + 1)^2 &= \sum_{k=1}^{10} (4a_k^2 + 4a_k + 1) \\ &= 4 \sum_{k=1}^{10} a_k^2 + 4 \sum_{k=1}^{10} a_k + \sum_{k=1}^{10} 1 \\ &= (4 \times 40) + (4 \times 10) + 10 \\ &= 210 \end{aligned}$$

63) 401

$$\begin{aligned} \Rightarrow \sum_{k=1}^{20} (k^2 + 1) - \sum_{k=1}^{19} (k^2 + 1) \\ = \sum_{k=20}^{20} (k^2 + 1) = 20^2 + 1 = 401 \end{aligned}$$

64) 5

$$\Rightarrow \sum_{k=1}^{20} k^2 - \sum_{k=3}^{20} k^2 = \sum_{k=1}^2 k^2 = 1^2 + 2^2 = 5$$

65) 80

$$\begin{aligned} \Rightarrow \sum_{k=1}^{20} (k^2 + 2) - \sum_{k=1}^{20} (k^2 - 2) \\ = \sum_{k=1}^{20} \{(k^2 + 2) - (k^2 - 2)\} = \sum_{k=1}^{20} 4 = 4 \times 20 = 80 \end{aligned}$$