

練習 28 p87

$$\begin{aligned}
 (1) \quad & \sum_{k=1}^n (2k+1) \\
 &= \sum_{k=1}^n 2k + \sum_{k=1}^n 1 \\
 &= 2 \sum_{k=1}^n k + \sum_{k=1}^n 1 \\
 &= 2 \cdot \frac{1}{2} n(n+1) + n \\
 &= n(n+1) + n \\
 &= n^2 + n + n \\
 &= n^2 + 2n
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & \sum_{k=1}^n (3k-5) \\
 &= \sum_{k=1}^n 3k - \sum_{k=1}^n 5 \\
 &= 3 \sum_{k=1}^n k - \sum_{k=1}^n 5 \\
 &= 3 \cdot \frac{1}{2} n(n+1) - 5n \\
 &= \frac{3}{2} n(n+1) - 5n \\
 &= \frac{3}{2} n^2 + \frac{3}{2} n - 5n \\
 &= \frac{3}{2} n^2 + \frac{3}{2} n - \frac{10}{2} n \\
 &= \frac{3}{2} n^2 - \frac{7}{2} n
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & \sum_{k=1}^{n-1} 4k \\
 &= 4 \sum_{k=1}^{n-1} k \\
 &= 4 \cdot \frac{1}{2} (n-1) \{ (n-1) + 1 \} \\
 &= 2(n-1)(n) \\
 &= 2n(n-1) \\
 &= 2n^2 - 2n
 \end{aligned}$$

$\frac{1}{2} n(n+1)$  の  $n$  は  $n-1$  に  $n$  を代入