

§ 1.2 数列の項の総和

問題 1.2.1

$$(1) \quad \sum_{i=0}^4 \frac{i^3}{10} = \frac{0^3}{10} + \frac{1^3}{10} + \frac{2^3}{10} + \frac{3^3}{10} + \frac{4^3}{10} = \frac{0+1+8+27+64}{10} = 10 .$$

$$(2) \quad \sum_{j=2}^5 \frac{12}{j+1} = \frac{12}{3} + \frac{12}{4} + \frac{12}{5} + \frac{12}{6} = 4 + 3 + \frac{12}{5} + 2 = 9 + \frac{12}{5} = \frac{57}{5} .$$

問題 1.2.2

$$\sum_{i=7}^{48} \left(\frac{24}{i-1} - \frac{24}{i} \right) = \frac{24}{6} - \frac{24}{7} + \frac{24}{7} - \frac{24}{8} + \frac{24}{8} - \frac{24}{9} + \cdots + \frac{24}{46} - \frac{24}{47} + \frac{24}{47} - \frac{24}{48} = \frac{24}{6} - \frac{24}{48} = \frac{7}{2} .$$

問題 1.2.3

$$\begin{aligned} & \sum_{j=2}^{28} (\sqrt{5j+4} - \sqrt{5j-1}) \\ &= \sqrt{14} - \sqrt{9} + \sqrt{19} - \sqrt{14} + \sqrt{24} - \sqrt{19} + \cdots + \sqrt{139} - \sqrt{134} + \sqrt{144} - \sqrt{139} \\ &= -\sqrt{9} + \sqrt{144} = -3 + 12 \\ &= 9 . \end{aligned}$$