

無限級数

無限級数 $\frac{1}{2} + \frac{5}{3} + \frac{1}{2^2} + \frac{5}{3^2} + \frac{1}{2^3} + \frac{5}{3^3} + \dots$ の和を求めよ。 [東京電機大]

$$a_n = \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \dots + \frac{1}{2^n}$$

$$b_n = \frac{5}{3} + \frac{5}{3^2} + \frac{5}{3^3} + \frac{5}{3^4} + \dots + 5 \cdot \left(\frac{1}{3}\right)^n$$

$$\begin{aligned} & \sum_{n=1}^{\infty} a_n + \sum_{n=1}^{\infty} b_n \\ &= \frac{1}{2} \cdot \frac{1}{1 - \frac{1}{2}} + \frac{5}{3} \cdot \frac{1}{1 - \frac{1}{3}} \\ &= 1 + \frac{5}{2} \\ &= \underline{\underline{\frac{7}{2}}} \end{aligned}$$