

第7題

$$P_n = P_{n-1} \times \frac{2}{5} + (1 - P_{n-1}) \times \frac{3}{5} = \frac{3}{5} - \frac{1}{5} P_{n-1}$$

$$P_n = \frac{1}{2} - \frac{\left(-\frac{1}{5}\right)^{n-1}}{10}$$

$$\sum_{n=1}^{\infty} \left(\frac{1}{2} - P_n\right) = \sum_{n=1}^{\infty} \frac{\left(-\frac{1}{5}\right)^{n-1}}{10} = \frac{\frac{1}{10}}{1 - \left(-\frac{1}{5}\right)} = \frac{1}{12}$$