

7.用遞迴關係做

$$P(n+1) = \frac{2}{5}P(n) + \frac{3}{5}[1-p(n)]$$

$$\Rightarrow P(n+1) = \left(-\frac{1}{5}\right)P(n) + \frac{3}{5}$$

$$\Rightarrow P(n+1) - \frac{1}{2} = \left(-\frac{1}{5}\right) \left[P(n) - \frac{1}{2}\right]$$

即  $\langle P(n) - \frac{1}{2} \rangle$  為首項  $P(1) - \frac{1}{2} = \frac{2}{5} - \frac{1}{2} = -\frac{1}{10}$ , 公比  $-\frac{1}{5}$  的等比數列

$$\text{原式} = -\sum_{1}^{\infty} \left[p(n) - \frac{1}{2}\right]$$

$$= -\frac{\left(-\frac{1}{10}\right)}{\left[1 - \left(-\frac{1}{5}\right)\right]} \text{(代等比公式)}$$

$$= \frac{1}{12}$$