

Exam P Problem 14

$$\Pr(N > 1)$$

$$= 1 - P_0 - P_1$$

$$P_{n+1} = \frac{1}{5} P_n \quad n \geq 0$$

$$n=0 \quad P_1 = \frac{1}{5} P_0$$

$$P_2 = \frac{1}{5} P_1 = \frac{1}{5} \cdot \frac{1}{5} \cdot P_0$$

$$P_3 = \left(\frac{1}{5}\right)^3 P_0$$

⋮

$$P_n = \left(\frac{1}{5}\right)^n P_0$$

$$1 = \sum_{n=0}^{\infty} P_n$$

$$= \sum_{n=0}^{\infty} \left(\frac{1}{5}\right)^n P_0$$

$$= P_0 \cdot \frac{1}{1 - \frac{1}{5}}$$

$$= \frac{5}{4} P_0$$

$$P_0 = \frac{4}{5}$$

$$P_1 = \frac{4}{5} \cdot \frac{1}{5} = \frac{4}{25}$$

$$\Pr(N > 1) = 1 - \frac{4}{5} - \frac{4}{25} = \frac{1}{25} = 0.04 \quad \boxed{A}$$