ITM529. Stochastic Processes

Short Quiz 3, 2025F, Weighting of 5%

Solution

Name: [   ]

#1. Find P^{100}. [5pt]

$$\mathbf{P} = \begin{pmatrix} 0.2 & 0.8 & 0 & 0 & 0 \\ 0.5 & 0.5 & 0 & 0 & 0 \\ 0 & 0.25 & 0 & 0.75 & 0 \\ 0 & 0 & 0.5 & 0 & 0.5 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix} \tag{1}$$

$$\mathbf{P}^{100} \approx \begin{pmatrix} \frac{5}{13} & \frac{8}{13} & 0 & 0 & 0 \\ \frac{5}{13} & \frac{8}{13} & 0 & 0 & 0 \\ \frac{5}{13}\left(\frac{2}{5}\right) & \frac{8}{13}\left(\frac{2}{5}\right) & 0 & 0 & \frac{3}{5} \\ \frac{5}{13}\left(\frac{1}{5}\right) & \frac{8}{13}\left(\frac{1}{5}\right) & 0 & 0 & \frac{4}{5} \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix} \tag{2}$$

Difficulty: Easy

Amount of work: 100%