

Antwoorden tentamen Wk, juni 2000P

- 1a) $8e^{-4}$
- 1b) 9.01 uur
- 1c) 9.02 uur
- 1d) $\frac{1}{16}$
- 1e) e^{-60p}
- 2a) gebruik definitie; $P = \begin{pmatrix} 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1-p & p \\ 0 & 0 & 1-p & p & 0 \\ 0 & 1-p & p & 0 & 0 \\ 1-p & p & 0 & 0 & 0 \end{pmatrix}$
- 2b) $P_{00}^{(2)} = 1-p$
- 2c) $P_{ii}^{(2)} = p^2 + (1-p)^2, i=1,2,3$
- 2d) $\pi = \frac{1}{5-p}(1-p, 1, 1, 1, 1)$
- 2e) $p\pi_0 = \frac{p-p^2}{5-p}$
- 3a) $\left(\frac{7}{5}\right)^5$
- 3b) $\frac{1}{15}$
- 4a) zie Ross, p. 372-373
- 4b) 325 uur
- 4c) $\frac{1}{121}$
- 4d) $336/55 \approx 6,11$
- 5a) $\frac{1}{3}P_j = \frac{1}{2}P_{j+1}, j=0,1,2$ of b.v.: $20P_0 = 30P_1$
 $\frac{1}{3}P_j = P_{j+1}, j=3,4,\dots$ $50P_j = 20P_{j-1} + 30P_{j+1}, j=1,2$
 $50P_3 = 20P_2 + 60P_4$
 $80P_j = 20P_{j-1} + 60P_{j+1}, j=4,5,\dots$
- 5b) $1-P_0 = \frac{14}{23}$
- 5c) $L = \frac{20}{23}, W = \frac{7}{115}$ uur = $\frac{84}{23}$ minuut
- 5d) als $X(t) \in \{2,3\}$ is toekomst afhankelijk van # kassas op tijdstip t , en dus van verleden van $X(t)$.
- 5e)
 - Diagram of a continuous-time Markov chain with states 0, 1, 2, 3, 4, 5, ...
 - Transitions: $0 \xrightarrow{\lambda} 1, 1 \xrightarrow{\lambda} 2, 2 \xrightarrow{\mu} 1, 2 \xrightarrow{3\mu} 2', 2' \xrightarrow{2\mu} 3, 3 \xrightarrow{\lambda} 4, 4 \xrightarrow{\lambda} 5, 5 \xrightarrow{3\mu} 4, 4 \xrightarrow{3\mu} 5, 5 \xrightarrow{\lambda} 6, \dots$
 - Equations: $\lambda = \frac{1}{2}, \mu = \frac{1}{2}$ or $\lambda = 20, \mu = 30$