

HW 2 Math 468/568

Due in the beginning of class Thursday, Feb 4, 2016.

1. Durrett 1.8 part (d)

2. Some manipulations.

(a) Show that $P_x\{T_y = n + 1\} = \sum_{z \neq y} p(x, z)P_z\{T_y = n\}$, $n \geq 1$.

(b) Show that $P_x\{T_y \leq n + 1\} = p(x, y) + \sum_{z \neq y} p(x, z)P_z\{T_y \leq n\}$, $n \geq 0$.

(c) Show that $\rho_{xy} = p(x, y) + \sum_{z \neq y} p(x, z)\rho_{zy}$.

3. Consider the Markov chain with transition matrix

$$P = \begin{bmatrix} .2 & .7 & .1 & 0 \\ .05 & .1 & .05 & .8 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Compute $\rho_{1,3}$ and $\rho_{2,3}$.