

Math 180B, Winter 2021

Homework 5

Exercises and Problems are from the course textbook *Introduction to Stochastic Modeling* (Fourth Edition) by Pinsky and Karlin.

Section 3.4. (pp. 105–111): Ex. 4.1, 4.2, 4.8; Pr. 4.1, 4.5, 4.8

Section 3.5. (pp. 121–124): Ex. 5.2, 5.3; Pr. 5.1, 5.4

Some of these problems require the inversion of the matrix $\mathbf{I} - \mathbf{Q}$. If you don't have access to *Mathematica* or *MATLAB* or similar, the website www.wolframalpha.com may be useful. For example, the input

`Invert`{`{1, -1/2, -1/2, 0, 0}`, `{-1/3, 1, 0, -1/3, 0}`, `{-1/3, 0, 1, -1/3, 0}`, `{0, -1/3, -1/3, 1, -1/3}`, `{0, 0, 0, -1/2, 1}`}

did the job of inverting $\mathbf{I} - \mathbf{Q}$ for

$$\mathbf{Q} = \begin{bmatrix} 0 & 1/2 & 1/2 & 0 & 0 \\ 1/3 & 0 & 0 & 1/3 & 0 \\ 1/3 & 0 & 0 & 1/3 & 0 \\ 0 & 1/3 & 1/3 & 0 & 1/3 \\ 0 & 0 & 0 & 1/2 & 0 \end{bmatrix}.$$