1. Consider a Markov process with states 0, 1 and 2 and with the following transition rate matrix Q:

$$Q = \begin{pmatrix} -\lambda & \lambda & 0 \\ \mu & -\lambda - \mu & \lambda \\ \mu & 0 & -\mu \end{pmatrix}$$

where $\lambda > 0$ and $\mu > 0$.

a. Derive the parameters v_i and P_{ij} for this Markov process.

b. Determine the expected time to go from state 1 to state 0.

2. Exercise 6.1.
3. Exercise 6.3.
4. Exercise 6.5.
5. Exercise 6.6 (a), (b).