1. Exercise 5.4, Chapter 5 of Levin, Peres and Wilmer.

2. Exercise 6.2, Chapter 6 of Levin, Peres and Wilmer.

3. **Kinght’s moves.** Consider a chessboard with a lone king making random moves. At each time, the king is equally likely to make any one of the available moves. Is the corresponding Markov chain irreducible and/or periodic? What is the mean recurrence time to a corner? (Hint: You should not have to do much computations to find the answer.) Suppose you start the chain in a fixed state. Does the chain converge to the equilibrium distribution? Answer the same questions with a knight instead of a king.

4. **Decisions, decisions...** An opera singer is due to perform a long series of concerts. Having a fine artistic temperament, she is liable to pull out each night with probability 1/2. Once this has happened, she will not sing again until the promoter convinces her of his high regard. This he does by sending flowers every day until she returns. Flowers costing $x$ times 10,000 USD, $0 \leq x \leq 1$, bring about a reconciliation with probability $\sqrt{x}$. The promoter stands to make about 7,500 USD from each successful concert. How much should he spend on flowers?

5. Exercise 7.1, Chapter 7 of Levin, Peres and Wilmer.