The ergodic theorem

- Explain the meaning of the word ergodic in the context of Markov chains.

- Why can't an ergodic Markov chain have transient states?

- Give a statement of the ergodic theorem ensuring that you define all the terms in the equation.

- Explain how you can calculate the expected return time to a state if you are given the stationary distribution.

The ergodic theorem

- Explain what is meant by the period of a state in the context of Markov chains.

- What is the greatest common divisor for the following sets of numbers $\{2, 4, 6, 8\}$, $\{4, 8, 12\}$, $\{4, 5, 8, 12\}$ and $\{4, 8, 12, 14\}$

- Draw the transition graph for a Markov chain involving 5 states in which every state has a period of 5 and a transition graph for a 5 state Markov chain in which every state has a period of 3.