

Homework 4
Exercises Not to Be Turned In.

1. Ross 2.9 (answer in back of text.)
2. Ross 2.14. Note there is a typo in the problem. " $P_{ij} \cdot \sum_{j>i} P_{ij} = 1$ " should read " P_{ij} , where $\sum_{j>i} P_{ij} = 1$." (answer in back of text.)
3. (Russ Lyon's Lecture Notes, problem 14): Suppose the lifetime of a machine is exponentially distributed with rate λ . The machine is checked to see whether it is operating or not at regular intervals: $T, 2T, 3T$, etc... Eventually, the machine is discovered to be down. What is the expected duration of the time the machine is actually down before it is discovered to be down?

Exercises to Turn In. Due Date: Friday, February 11

1. Ross 2.13
2. (Russ Lyon's Lecture Notes, problem 16): A machine needs 2 types of parts to work, type A and type B. It has one part of each type to begin, and there are also 2 spare A parts and 1 spare B part. When a part fails, it is replaced by a spare part of the same types, if available, instantaneously. Suppose that the lifetimes (time in service) of all parts are independent. Parts of type A have a lifetime which are exponentially distributed with rate λ . Parts of type B have lifetimes which are exponentially distributed with rate μ . What is the expected time until the machine fails for lack of a needed part?
3. Ross 2.30
4. Ross 2.33
5. Ross 2.37