

Math 547 – Assignment 2

Assigned on January 30, 2018. Due on February 18, 2018 at 11 PM, via myCourses.

The below problems are all from Grimmett and Stirzaker. Feel free to discuss with others, but write your own solutions in your own words. Explain your work.

1. Exercises 5.4.2 and 5.4.5
2. Exercises 6.1.3, 6.1.6 and 6.1.8
3. Exercises 6.2.4 and 6.2.5
4. Exercises 6.3.6 and 6.3.9
5. Exercises 6.4.3 and 6.4.8 and 6.4.11
6. Bonus exercise. I haven't thought this through carefully so proceed at your own risk.
 - (a) Suppose that $(Z_i, i \geq 1)$ are IID non-negative random variables with mean 1, and Y is another random variable, taking values in $\{0, 1, 2, \dots\}$. Suppose that $\mathbb{P}(Y > Z_1 + \dots + Z_m) \leq 2^{-m}$ for all m . Show that $\mathbb{E}(Y) < \infty$.
 - (b) Use part (a) to prove that if $\mathbb{E}_i(\tau^+(i)) < \infty$ and $i \rightarrow j$ then $\mathbb{E}_i(\tau(j)) < \infty$.