E2–202 Random Processes Due: 05 November 2026

Problem Set 9

Instructors: Rajesh Sundaresan
TAs: Sowmya, Ram Rathan, Tithi, Yash, Dwaipayan

Remarks:

- Collaboration, discussion, and working in teams to solve problems is strongly encouraged.
- To test your understanding, practice the solution to each problem in your own words without referring to a friend, text, class notes, or AI engines.

Problems:

1. Suppose $\mathbb{E}[X_2] = \infty$. Argue that $\lim_{t\to\infty} m(t)/t = 0$.
2. Exercise 3.1 of the reference text.
3. Prove the renewal reward theorem (Theorem 3.3).
4. Problem 3.1 of Section 3.13 of the reference text.
5. Problem 3.2 of Section 3.13 of the reference text.
6. Problem 3.3 of Section 3.13 of the reference text.
7. Problem 3.4 of Section 3.13 of the reference text.
8. Problem 3.5 of Section 3.13 of the reference text.
9. Problem 3.6 of Section 3.13 of the reference text.
10. Exercise 3.2 of the reference text.