

Expected Values for DRVs

Mini-Assignment 2022-09-27 - MTH 461 - Fall 2022

Instructions:

- Please provide complete solutions for each problem. If it involves mathematical computations, explanations, or analysis, please provide your reasoning or detailed solutions.
- Note that some problems have multiple solutions or ways to solve it. Make sure that your solutions are clear enough to showcase your work and understanding of the material.
- Creativity and collaborations are encouraged. Use all of the resources you have and what you need to complete the mini-assignment. Each student must take personal responsibility and submit their work individually. Please abide by the University of Portland Academic Honor Principle.
- There are two ways you can write your answers, a: by handwriting (either physically or digitally), or b: by typing on a template document with file type options, which can be downloaded from the course website.
- If you had handwritten your answers/solutions on a physical paper, make sure to label it properly and please scan your document using a scanner app for convenience. Suggestions: (1) [“Tiny Scanner” for Android](#) or (2) [“Scanner App” for iOS](#).
- **Please save your work as one pdf file, don't put your name in any part of the document, and submit it to the Teams Assignments for this course. Your document upload will correspond to your name automatically in Teams.**
- If you have questions or concerns, please feel free to ask the instructor.

1. [PSDR Exercise 3.7] Suppose you roll two ordinary dice. Calculate the expected value of their product.
2. [PSDR Exercise 3.11] A roulette wheel has 38 slots and a ball that rolls until it falls into one of the slots, all of which are equally likely. Eighteen slots are black numbers, eighteen are red numbers, and two are green zeros. If you bet on “red,” and the ball lands in a red slot, the casino pays you your bet; otherwise, the casino wins your bet.
 - a. What is the expected value of a \$1 bet on red?
 - b. Suppose you bet \$1 on red, and if you win you “let it ride” and bet \$2 on red. What is the expected value of this plan?
3. [PSDR Exercise 3.15] Let k be a positive integer and let X be a random variable with pmf given by $p(x) = \frac{1}{k}$ for $x = 1, \dots, k$ and $p(x) = 0$ for all other values of x . Find $E[X]$.