

# 1 Homework H

- **Due: Friday, September 25, 2:45 PM**
- Please refer to the [syllabus](#) for homework policies.
- If you explicitly do not want your submission to be considered as a solution key, please state so clearly at the top of your submission.
- If you put your solutions for different problems on different pages (e.g., with the `\clearpage` command) that would be appreciated.
- *I decided not to give the max flow problem after all.*

## Problems

1. For  $k \in \mathbb{N}$ , suppose you repeatedly flip a coin that is heads with fixed probability  $p \in (0, 1)$  until you obtain  $k$  heads.
  - (a) What is the expected number of coin flips until you obtain 1 heads? Prove your answer.
  - (b) What is the expected number of coin flips until you obtain 2 heads? Prove your answer.
  - (c) For general  $k \in \mathbb{N}$ , what is the expected number of coin tosses until you obtain  $k$  heads? Prove your answer.