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## MATH 4581: STATISTICS AND STOCHASTIC PROCESSES

**Bonus problems I****Problem 1**

- (a) [5 pts] A theatre on Broadway has  $n \geq 2$  seats, and the upcoming show is sold out. A line of  $n$  people enter one by one. Each has an assigned seat, but the first person has lost his ticket and sits in a seat chosen at random. Subsequent people occupy their assigned seats if free, and randomly chosen empty seats if not. What is the probability that the last spectator sits in his or her seat according to the purchased ticket?
- (b) [5 pts] Same setup as in (a) but now the first  $m$  people have lost their tickets and occupy random seats. Assume that  $n > m$ . Subsequent people occupy their assigned seats if free, and randomly chosen empty seats if not. What is the probability that the last spectator sits in his or her seat according to the purchased ticket?