[40] **Homework 9**: *Discrete Probability*

[10] Show that if A and B are independent events, then $\bar{A}$ and $\bar{B}$ are also independent events.

[10] What is the probability of a five-card poker hand contains the ace of hearts?

[5] What is the conditional probability that exactly four heads appear when a fair coin is flipped five times, given that the first flip came up tails?

[15]. Let X_n be the random variable that counts the difference in the number of tails and the number of heads when n coins are flipped. Assume that the probability of throwing a head is $p = 0.3$. Compute $\mathbf{E}[X_n]$ and $\mathbf{Var}[X_n]$.