

Math 461, Written Homework 2a

Due 09/14 in class

1. Two fair dice are thrown. Let E be the event that the sum of the dice is odd; let F be the event that at least one of the dice comes up 1; let G be the event that the sum of the dice is 5. Find the probabilities of following events: $E \cap F$, $E \cup F$, $E \cap F^c$ and $E \cap F \cap G$.
2. Three fair coins are flipped. Let A be the event that the first flip equals the second flip; let B be the event that the first flip is different from the third flip; and let C be the event that the second flip is different from the third flip. Find $\mathbb{P}(A)$, $\mathbb{P}(B)$, $\mathbb{P}(C)$, $\mathbb{P}(A \cap B)$, $\mathbb{P}(A \cap C)$, $\mathbb{P}(B \cap C)$, $\mathbb{P}(A \cap B \cap C)$.
3. Two fair dice are rolled. Let X be the product of the two dice. Find the probability mass function of X .
4. Two balls are randomly chosen from a box containing 8 white, 4 black and 2 orange balls. Suppose that we win \$2 for each black ball selected and we lose \$1 for each white ball selected. Let X be our winning. (a) Find the probability mass function of X when the balls are chosen without replacement; (b) Find the probability mass function of X when the balls are chosen with replacement.