

CSE21 WI13

Homework #4

[Each problem is worth 10 points.]

4.1 A *warped* coin has probability of 0.5 of landing Heads, probability of 0.4 of landing Tails, and probability 0.1 of landing on its Edge. (I said it was warped!). It is flipped 5 times. What is the probability that more Heads occur than Tails?

4.2 (a) 10 cards are drawn at random one at a time *with replacement* from an ordinary deck of cards. What is the sample space? What is the probability that no Ace appears on any of the draws? What is the probability that at least one King appears in 10 draws? What is the probability that at least 2 Queens appear in the 10 draws?

(b) What are the corresponding probabilities in (a) if the drawing is done *without replacement*?

4.3 Let A and B be events with $P(A) = \frac{3}{7}$, $P(B) = \frac{1}{2}$ and $P((A \cup B)^c) = \frac{3}{8}$. What is $P(A \cap B)$?

4.4 12 identical jellybeans are distributed randomly to 5 students. What is the probability that each student gets at least one jellybean? What is the probability that each student gets at least two?

4.5 A bin at Blockbuster contains 100 DVD's of which 20 are defective. You randomly select 10 and try them out at home. You discover that there 2 defective DVD's in the 10 that you selected. The store now allows you to select 2 replacements from the same bin (which now only has 90 DVD's in it, since you already removed 10). What is the probability that *none* of 10 DVD's you finally end up with are defective? What is the answer to this question if you find k defectives in your initial choice?

4.6 An urn contains 2 Red marbles, 3 White marbles and 4 Blue marbles. You reach in and draw out 3 marbles at random (*without replacement*). What is the probability that you will get one marble of each color? What is the answer if you draw out the marbles one at a time *with replacement*?