Homework 1

Individual Problems:

1. Urn I contains two white chips and one red chip. Urn II has one white chip and two red chips. One chip is drawn at random from urn I and transferred to urn II. Then one chip is drawn from urn II. Suppose that a red chip is selected from urn II. What is the probability that the chip transferred was white?

Group Problems:

1. Suppose three coins are in an urn. One coin is black, one coin is white, and one coin is black on one side and white on the other. Imagine you draw a coin, lay it on the table, and observe that the side that is showing is white. What is the probability that the other side is also white?

2. Suppose that two events $A$ and $B$, each having non-zero probability, are mutually exclusive. Are they also independent?

3. Suppose a certain allele has a dominant variant $G$ and a recessive variant $g$. If the probability of $GG$, $Gg$, and $ww$ genotypes in the present generation are $p$, $q$, and $r$, respectively, what are the chances that an individual in the next generation will be a $gg$?

4. Bob is interviewing for a job. If the interview goes well, he has a 60% chance of being offered the job. If the interview goes poorly, he has a 20% chance. Unfortunately, Bob tends to drool, so the chances of the interview going well are only about 30%. What are his chances of landing the job?