Worksheet 05

1. The workers in a particular factory are 65% male, 70% married, and 45% married male. If a worker is selected at random from this factory, find the probability that (a) a female worker is married, (b) a married worker is female.

2. Psychology majors are required to take two particular courses: Psychology 100 and Psychology 200. It is a rare student indeed who does outstanding work in both courses. It is known that the chances of getting an A in PSY 100 is .4 and the chances of getting an A in PSY 200 is .3, while the chances of getting an A in both courses are .05. What are the chances (a) that a student who get's an A on the first exam will get an A on the second exam and (b) that a student who doesn't get an A on the first exam will get an A on the second exam?

3. You give a friend a letter to mail. He forgets to mail it with probability .2. Given that he mails it, the Post Office delivers it with probability .9. Given that the letter was not delivered, what's the probability that it was not mailed?

4. The Rhetoric Department offers the popular course "Statistically Speaking" two times a year. The final (and only) exam in the course is a fifty-question multiple-choice test. If rhetoric major Rhett Butler knew the answer to forty of the questions, and selected an answer at random (from among five possible answers) for the remaining ten questions, what is the probability that he actually knew the answer to a particular question that he got right?

5. Two people work independently on deciphering a coded message. Their probabilities of success are 1/2 and 1/4, respectively. What is the probability that the message will be decoded? Try to apply the addition rule and the definition of independence to get to the result.

6. At an upcoming holiday gathering, cousins William and Brenda will play a game, repeatedly and independently, until one of them wins. A given game ends in a tie with probability p_1. The probability that William wins an individual game is p_2, while the probability that Brenda wins an individual game is p_3. Find the probability that William is the eventual winner.