Exercises on Probability

1. Suppose that in a sample of 200 students, 120 are taking an English course, 110 are take a Mathematics course, and 60 are taking both Math and English. If a student is randomly selected from this sample, what is the probability that

- **a.** the student in not taking any Math course?
- **b.** the student is taking English but not Math?
- **c.** the student is taking Math but not English?
- **d.** the student is taking at least one of these two courses?
- **e.** the student is NOT taking any of these two courses?
- **f.** the student is taking English given that he/she is taking Math?
- **g.** the student is taking Math given that he/she is taking English?

2. The probability the a certain bank will setup a new branch in La Crosse is .80. The probability that this bank will setup a new branch in Onalaska is .70. The probability that the bank will setup a new branch in both cities is .60. What is the probability that this bank

- **a.** will NOT setup a new branch here in La Crosse?
- **b.** will setup a new branch in at least one of these two cities?
- **c.** will NOT setup a new branch in either cities?
- **d.** will setup a new branch in Onalaska given that it already setup a new branch in La Crosse?
- **e.** will setup a new branch in La Crosse given that it already setup a new branch in Onalaska?

3. If 4 girls and 6 boys are to be seated in a row, what is the probability that

- **a.** all the girls will be sitting together?
- **b.** all the boys will be sitting together?
- **c.** a particular girl (Rosy) and a particular boy (Rex) will not be together?

4. In the previous problem, suppose you want to form a dance group of five. What is the probability that the dance group will be composed of

- **a.** all boys?
- **b.** 3 boys and 2 girls?
- **c.** all girls?
- **d.** at least 1 girl?

5. Police plans to enforce speed limits by using radar traps at 4 different locations within the city limits. The radar traps at each of the locations L_1, L_2, L_3, and L_4 are operated 30%, 40%, 50%, and 20% of the time, respectively. A person who is speeding on his way to work has probabilities of 0.2, 0.1, 0.5, and 0.2, respectively, of passing through these locations. Construct the appropriate tree diagram to answer the questions below (5 pts.). What is the probability that

- **a.** he will either pass through L_1 or L_2?
- **b.** he will pass through L_3 and will not receive a speeding ticket?
- **c.** he will not receive a speeding ticket?
- **d.** he passed through L_4 given that he received a speeding ticket?