MATH 110 – 31 OCTOBER 2006 – EXAM 2

Answer each of the following questions. Show all work, as partial credit may be given.

1. (5 pts. each) Suppose that E and F are events in a sample space S and that $Pr(E) = .5$, $Pr(F) = .6$, and $Pr(E \cup F) = .8$.

(a) Find $Pr(E \cap F)$.

(b) Find $Pr(E \cap F')$.

(c) Find $Pr(E|F)$.

(d) Find $Pr(F|E)$.

(e) Are the events E and F mutually exclusive? Why or why not?

(f) Are the events E and F independent? Why or why not?

2. (10 pts. each) A bag containing 30 M&Ms consists of 10 red, 10 blue, 5 yellow and 5 brown M&Ms.

(a) What is the probability that a random sample of 4 M&Ms are all red?

(b) What is the probability that a random sample of 4 M&Ms are all different colors?

3. (10 pts.) The probability of winning \$25 in a certain lottery game is .01. Suppose that you play the game once a day for 90 consecutive days. Assuming that the events are independent, what is the probability that you will win \$25 at least once during that 90 day period?

4. (10 pts. each) There are 2 sections of English 101. In Section A, there are 25 students of whom 5 are math majors, in Section B there are 50 students of whom 6 are math majors.

(a) Draw a tree diagram describing this situation.

(b) What is the probability that a student chosen at random from the students taking English 101 is NOT a math major?

(c) Find the probability that a student is a math major given that the student is from Section B.

(d) Find the probability that a student is from Section B given that the student is a math major.