

MATH 110 – 4 NOVEMBER 2009 – EXAM 2

Answer each of the following questions. Show all work, as partial credit may be given. This exam is counted out of a total of 80 points.

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 $Pr(E|F)$.
 - (c) Find $Pr(F|E)$.
 - (d) Are the events E and F independent? Why or why not?

2. (8 pts. each) A bag containing 20 M&Ms consists of 10 red, 5 blue, and 5 brown M&Ms.
 - (a) What is the probability that a random sample of 3 M&Ms are all red?
 - (b) What is the probability that a random sample of 3 M&Ms are all different colors?

3. (8 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. 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 15 are math majors.
 - (a) (12 pts.) Draw a tree diagram describing this situation.
 - (b) (8 pts.) What is the probability that a student chosen at random from the students taking English 101 is NOT a math major?
 - (c) (8 pts.) Find the probability that a student is from Section A given that the student is a math major?
 - (d) (8 pts.) Find the probability that a student is from Section B given that the student is a NOT math major?