Math 477, Lecture 7 class work

Name: _____

Net ID: _____

1. Suppose that in a population consisting of an equal number of males and females, 5% of the males are color blind, and 0.25% of the females are color blind. If a person is chosen at random and is found to be color blind, what is the probability that they are male?

2. Show that if $P(A|B) = 1$ then $P(B^c|A^c) = 1$.

3. Either explain why the following statement is true, or find a counterexample: If A is independent of E and A is independent of F, then A is independent of $E \cup F$.

4. Suppose that we have two jars. The first jar contains 5 white balls and 8 black balls. The second jar contains 10 white balls and 1 black ball. Suppose that a person chooses a jar at random (each with equal probability), chooses a ball at random from the jar (each with equal probability), and then takes it out and places it in the other jar. If they repeat this action twice, let E be the event that the first ball moved is black and F be the event that the second ball moved is black.

   (a) What is $P(F|E)$?

   (b) Are E and F independent?