Practice for Exam 1

Math 362, Spring 2011

1. Suppose that a company buys items from three suppliers, I, II, and III. The record is that 2% of the items from supplier I are defective, 3% of the items from supplier II are defective, and 5% of the items from supplier III are defective. Suppose 20%, 30%, and 50% of the current supply came from Suppliers I, II, and III, respectively.
(A) If an item is selected at random from this supply, what is the probability that it is defective?
(B) If a randomly selected item is defective, what is the probability that it came from supplier III.

2. Suppose that an urn contains 4 green and 5 black balls. Suppose that 4 balls are removed from the urn without replacement. Let G_i be the event that the ball drawn on the i^{th} draw is green and B_i be the event that the ball drawn on the i^{th} draw is black. Find $P(B_3)$ and $P(G_1B_4)$.

3. A hand of 8 cards is dealt from a deck of 52 cards.
(A) How many hands with at most 5 diamonds are possible?
(B) What is the probability that the hand has 2 diamonds and 6 black cards?

4. Suppose a fair coin is tossed 4 times.
(A) What is the probability that there are exactly 3 heads?
(B) Given that heads occurs on the first 3 tosses, what is the conditional probablity that heads occurs on the 4^{th} toss?

5. In a U of A class of 30 students, 11 read Arizona Daily Wildcat, 9 read Arizona Daily Star, and 13 read at least one of these newspapers. A randomly selected student is asked whether he or she reads Arizona Daily Wildcat or Arizona Daily Star.
Determine the probability that the selected student
(A) reads both Arizona Daily Wildcat and Arizona Daily Star.
(B) reads only Arizona Daily Wildcat.
(C) reads Arizona Daily Wildcat or Arizona Daily Star, but not both.

6. An electrical circuit has two relays in parallel. The probability that each relay closes when the switch is thrown is 0.9. Assuming that the relays operate independently of one another, what is the probability that current will flow through the circuit when the swich is thrown?

7. Suppose a box contains two coins, of which one is two-headed and one is fair. If the coin is tossed n times and it yields n heads, what is the probability that the two-headed coin was selected?