Math 170- Study Guide 7.4

Instructions: Answer all questions. Clearly justify your reasoning.

1 Section 7.4

Problem 1) Determine the probabilities of drawing the following poker hands.

(a) A *Royal Flush* consists of ranks 10, J, Q, K, A, all of the same suit.

(b) A *Straight Flush* consists of five cards with values in a row, all of the same suit. An Ace may be considered as the highest rank (so Ace immediately follows king) or lowest rank (so Ace immediately precedes 2), but not both. So for example, A, 2, 3, 4, 5 (with all cards of the same suit) is a straight flush, but Q, K, A, 2, 3 is **not** a straight flush.

(c) A *Straight* consists of five cards with consecutive ranks, not all of the same suit. Just as in a straight flush, the Ace may be considered as the highest rank or lowest rank, but not both.

(d) A *Flush* consists of five cards, all of the same suit.

(e) A *Four of a Kind* consists of four cards of one rank, and a fifth card of a different rank.

(f) A *Full House* consists of three cards of one value, and two cards whose values are the same as each other but different than the first three cards. (E.g., three Queens and two 10's).

(g) A *Three of a Kind* consists of three cards of one rank, and two more cards each of different ranks. So there are three distinct ranks in this hand.

(h) A *Two Pair* consists of two pairs, one pair of the same value and a second pair of a different value. The fifth card has yet a different value. (E.g., two 10's, two Queen's, and a King).

(i) A *One Pair* consists of a pair of one value, and then three additional cards each of a different value. (E.g., 10, 10, Ace, Jack, Queen).

Problem 2) Suppose we have a Pick-5 Lottery. Each ticket consists of 5 distinct numbers, chosen from $1, 2, \ldots, 50$. The order in which the numbers are listed does not matter. What is the probability that your ticket matches exactly three of the five winning numbers?