MATH 113: DISCRETE STRUCTURES
HOMEWORK DUE MONDAY WEEK 10

Problem 1. A five-card hand is dealt randomly from a deck of 52 cards. What is the probability that there are exactly two pairs in the hand? (By "two pairs" we mean two different pairs and then a singleton, like $\{K\clubsuit, K\diamondsuit, 4\spadesuit, 4\diamondsuit, J\heartsuit\}$, not a full house and not four of a kind.)

Problem 2. Consider the set of functions $F = \{f \mid f\colon \{a, b, c, d, e\} \to \{1, 2, 3, 4\}\}$.

a) What is $|F|$?

b) If we choose a function at random from F, what is the probability that the function is surjective?