Second Homework Assignment

Write the solution to each question on a single page. The deadline for handing in solutions is January 08, 2014.

**Question 1.** (20 = 7 + 7 + 6 points). Pick a random function $f : [n] \to [n]$ from the uniform distribution under which every function is equally likely. What is the probability that your function is

(a) injective,
(b) surjective,
(c) bijective?

**Question 2.** (20 = 10 + 10 points). Suppose you have a fair coin, one in which a flip gives head with probability one half and tail with probability one half.

(a) What is the expected number of coin flips you need to get two heads in a row?

(b) What is the expected number of coin flips you need to get a head immediately followed by a tail?