Homework 3

1. An ordinary deck of 52 cards is divided into 4 equal parts randomly, that is, each division is equally likely. What is the probability that each pile contains one Ace? Do this in two ways: one using conditional probability and another using the basic definition with equally likely outcomes.

2. Problem 3.13 of textbook.

3. Problem 3.22 of textbook

4. Theoretical exercise 3.5 of textbook

5. Let N be a natural number and $a_1, a_2, \cdots, a_n$ natural numbers that are relatively prime, that is to say, $gcd(a_i, a_j) = 1$ if $i \neq j$. Let R be a random number selected from $\{1, 2, \cdots, N\}$. Find the probability that R is divisible by none of the a_i.