Probability Practice Problems.

(1) Seven car accidents happened in a week. What is the probability that they all happened the same day?

(2) Two distinct numbers are chosen from $\{1, 2, \ldots, 100\}$. What is the probability that the sum of the numbers is divisible by 3? What if the set of numbers is changed to $\{1, 2, \ldots, n\}$?

(3) One of ten keys opens a door. What is the probability that the first key tried opens the door? Second key? ith key? Show that the sum of all probabilities for the individual keys is 1.

(4) There are 10 pairs of shoes in a closet. If you select 8 shoes at random, what is the probability that no matching pair is chosen?

(5) You have a red box, a green box and a yellow box, and you have 10 identical balls of each color. What is the probability that a distribution of balls to boxes has no ball in a box of the same color. What is the probability that no ball goes in a box of the same color and (in addition) every box must get a ball?

(6) Rank the 5-card poker hands according to their likelihood. (One pair, two pair, three of a kind, full house, straight, flush, straight flush, royal flush.)