Worksheet #21; date: 11/07/2018
MATH 55 Discrete Mathematics

1. *(Rosen 7.1.6)* What is the probability that a card selected at random from a standard deck of 52 cards is an ace or a heart?

2. *(Rosen 7.1.30)* What is the probability that a player of a lottery wins the prize offered for correctly choosing give (but not six) numbers out of six integers chosen at random from the integers between 1 and 40, inclusive?

3. What is the probability that a player wins prize above and do not need to split it with anyone else, if there are a million players in total?

4. Suppose we randomly generate a number by summing two independence die rolls. How many possible numbers can we generate? Explain why the probability of getting an 8 is not simply $1/N$ where N is the number of possible outcomes.

5. *(Rosen 7.2.16)* Show that if E and F are independent events, then $\bar{E}$ and $\bar{F}$ are also independent events.

6. A fair coin is tossed 5 times. What is the probability of the first two being heads if it is known there are only two heads in total?

7. *(Challenging and confusing)* Suppose we ring the door bell of a family with two children. A young girl answers the door. What is the probability of the other child also being a girl?