ECE 3020 Homework 5
Due Date: 10/4/2017, 5:00 PM

1) On-line text, Problem 4.10.6. Assume all possible sequences of wins and losses are equally likely.

2) Consider a probability space where outcomes are *not* equally likely. For example, in the arcade game called Skee Ball, players roll a ball up a ramp and it lands in different areas, which are worth different points ranging from 10 to 50. Since the areas are of different sizes, if a ball is rolled randomly up the ramp, the probabilities that the ball lands in different areas are not equal. Assume that the following probabilities are associated with the different areas:

Value	Probability
10 points	0.5
20 points	0.25
30 points	0.15
40 points	0.08
50 points	0.02

If a player rolls 3 balls at random:

a) What is the probability of a total score of at least 100 points?

b) Given that the first ball scores 30 points, what is the probability of a total score of at least 100 points? Are the events "the first ball scores 30" and "the total score is at least 100" independent? Why or why not?

c) What is the expected total score? What is the variance of the score on one roll?

Additional Study Problem – Not to be turned in!

3) The graduating class for a nearby high school has 47% males and 53% females. 21% of the males are 19 years of age or older, but only 8% of the girls are 19 years of age or older. We will select a student at random from this graduating class.

a) What is the probability that he or she is younger than 19 years of age?
b) Are gender and age of student independent in this class? Explain.
c) Given that a student is 19 years old or older, what is the conditional probability that this is a male?
d) Given that a student has an age less than 19 years, what is the conditional probability that this is a girl?