Due on Tuesday October 4 at the beginning of lecture.

1. 2.7.11

2. 2.7.15

3. 3.2.4

4. Consider the experiment of rolling six six-sided dice. The sample space $S$ is all length-six sequences made up of integers 1 to 6, with replacement. Find (a) the probability of all dice yielding the same number, and (b) the probability that all the numbers are distinct.

5. Let $Y_i$ be a random variable (for $i = 1, 2, 3, 4$) given by the following functions of the outcomes in the experiment described above (in Problem 4). For each of these new random variables $Y_i$ given below, describe (1) the new sample space associated with $Y_i$ (i.e., $S_{Y_i}$) and (2) the probability function $P(Y_i = k)$ for appropriate values of $k$.

   (a) $Y_1$ is the number of even integers in the sequence.

   (b) (461 only) $Y_2$ is the number of integers greater than 3 in the sequence.

   (c) $Y_3$ is the number of 2s in the sequence.

   (d) (661 only) $Y_4$ is the indicator function that tests if the sequence sum is less than 8.

6. 3.2.11

7. 3.2.22

8. 3.2.26

9. 3.2.34 (461 only)

   3.2.35 (661 only) Note: The odd questions are answered in the back of the text, so points will be awarded for the justification/proof, not just the formula!