

Homework 9

Due 11.17.11 (Thursday)

1. A bag contains thirty marbles numbered from 1 to 30. Five marbles are drawn at random from the bag. There are a few ways to think about this:
 - a. Marbles are drawn one at a time without replacement. That is, once a marble is drawn, it is not replaced in the bag.
 - b. Marbles are drawn all at once without replacement. That is, five marbles are snatched up at once.
 - c. Marbles are drawn one at a time with replacement. Once a marble is drawn, it is tossed back into the bag. Then the next marble is drawn, tossed back in, and so on.

For each of these interpretations,

- (i) describe the sample space. How large is the set?
 - (ii) What is the probability that the marble numbered 5 is *not* among those drawn from the bag?
 - (iii) What is the probability that at least one of the marbles numbered 16, 17, 18, 19, 20 are among the five marbles drawn from the bag?
2. A 5-sided die with sides numbered 1, 2, 3, 4 and 5 is constructed so that the 1 and 5 occur twice as often as the 2 and 4, which occur three times as often as the 3. What is the probability that a perfect square occurs when this die is tossed once?
 3. In the game of *Yahtzee*, five dice are tossed simultaneously. Find the probability of getting
 - (i) all 1's
 - (ii) 4 of a kind
 - (iii) 2 pairs
 - (iv) the numbers 1, 2, 3, 4, 5
 - (v) all distinct numbers
 4. Sec. 7.2: 26, 30.
 5. Sec. 7.3*: 2, 4.

*Note: Even though we didn't cover Section 7.3 in class, you can answer these questions because they are all about conditional probabilities.