

**Homework 2: Combinatorics and Probability (Part 1)**

1. §1.5, #7
2. §1.7, #6, 8, 10
3. §1.8, #1, 4
4. Five differently-colored golf balls are randomly thrown into nine different buckets. Find the probability that
  - (a) none of the golf balls lands in bucket 1.
  - (b) no two golf balls land in the same bucket.
  - (c) the red, white, and blue golf balls land in different buckets.
5. A deck of cards is shuffled. Find the probability that
  - (a) the top five cards are all different denominations.
  - (b) the bottom four cards are all the same denomination.
  - (c) the top card is an ace.
  - (d) the third card from the top is an ace.