1. You have an urn with 5 red balls, 10 blue balls, and 15 black balls. You draw 5 balls without replacement.
   a. What is the probability that you draw $i$ red balls and $j$ blue balls?
   b. Suppose you win $1.00 for each red ball and $3.00 for each blue ball. How much are your average winnings?

2. a. Simplify $\sum_{1 \leq i \leq n} \frac{3^{n+i}}{5^{n+2i}}$.
   b. Simplify $\sum_{i} (n - i + 1)^2 \binom{n}{i} 5^i$.

3. Suppose you have a table of $n$ different numbers in random order. Suppose you search through the table, starting at the second number until you find a number bigger than the first number.
   a. What is the probability that you examine $i$ numbers? What is the probability that you don’t find a bigger number?
   b. What is the average number of numbers examined?