Nov 30 Homework

1. (cf Schumer Problem 16.3) Does any row of Pascal's triangle have three consecutive entries in the ratio 1:4:7 (if so, which row)?

2. a. If we have 4 red, 5 blue and 3 green tennis balls, in how many distinguishable ways can we stack them all in a long can? Assume we cannot distinguish between balls of the same color.
   b. What if we paint numbers 1-12 on these balls, now how many distinguishable ways can they be stacked?
   c. What if only the green balls are numbered (1-3)?

3. a. If $(x_1 + x_2 + x_3 + x_4 + x_5 + x_6)^{43}$ is expanded out, how many terms are there after like terms have been collected?
   b. What is the coefficient of $x_1^7 x_2^3 x_3^{10} x_4^{11} x_5^6 x_6^6$ in this expansion?

4. Write out the first 12 rows of Pascal's triangle (bottom row corresponds to n=11), and verify the conclusion of Problem 16.6 for this part of Pascal's triangle.

5. a. If a fair coin is flipped 17 times, what is the probability that there will be exactly m heads?
   b. If a weighted coin, which has probability p of heads on any toss, is flipped 17 times, what is the probability that there will be exactly m heads?
   c. Show algebraically that in the weighted coin experiment of part (b), the sum of the probabilities of m heads, for $m = 0, 1, 2, 3, ..., 17$, is 1.0.