Math 456/556: Networks and Combinatorics
HW #4, due Monday, 2/1

The following problems from the textbook are **not** to be turned in:

Chapter 6: 2, 5, 9, 13, 15, 21, 29, 32.

The following problems are to be turned in:

4.1 How many integers between 1 and $729 = 3^6$ are neither squares nor cubes?

4.2 Fix a positive integer n.

(a) Given a random permutation of the set $\{1, \ldots, n\}$, show that the probability that exactly one element is fixed is approximately equal to the probability that no elements are fixed. (Hint: Use the fact that $D_n \approx \frac{n!}{e}$.)

(b) These two probabilities are approximately equal, but they are not exactly equal, and which one is bigger depends on n. Which is bigger when $n = 100$?

4.3 Compute the number of integer solutions to the equation $x_1 + x_2 + x_3 = 17$ with $1 \leq x_1 \leq 6$, $0 \leq x_2 \leq 5$, and $2 \leq x_3 \leq 10$.