Math 456/556: Networks and Combinatorics
HW #5, due Wednesday, 2/17

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

Chapter 7: 2, 3, 13(a,b,d,e), 15, 16, 18, 19, 33, 39.

The following problems are to be turned in:

5.1 Define a sequence by putting

$$h_0 = 3, h_1 = -2, \text{ and } h_n = h_{n-1} + 12\, h_{n-2} \text{ for all } n \geq 2.$$

Compute h_n.

5.2. Write down a rational generating function for each of the following sequences.

a) $h_n = \binom{100}{n}$.

b) $h_n =$ the number of non-negative integer solutions to the equation $e_1 + \ldots + e_{100} = n$.

c) $h_n =$ the number of non-negative integer solutions to the equation $e_1 + 2e_2 + 3e_3 + 4e_4 = n$.

d) $h_n =$ the number of n-combinations of apples, bananas, and oranges with a multiple of three apples, and odd number of oranges, and at most 17 bananas.

e) h_n is the number that you computed in Problem 5.1.