HW #4, due September 24th

Chapter 3: 21, 22, 26, 32-39, 43, 50

Chapter 5: 5, 8, 9, 11, 22 (comb. proof), 25, 29, 30 (comb. proof), 41

Extra Problems for HW #4

Problem 1: Give a combinatorial proof of the following identity:

\[ n(n-1)2^{n-2} = \sum_{k=0}^{n} k(k-1) \binom{n}{k}. \]

Problem 2: Show that the function \( \Gamma \) is a bijection. (Hint: Show that it is the composition of bijections.)

* Bonus Problem: From class we saw the identity

\[ n(n+1)2^{n-2} = \sum_{k=0}^{n} k^2 \binom{n}{k}. \]

Prove this identity combinatorially.