A. Chapter 8, problem 2.

B. Find (and prove) a formula for the number of integer sequences $a_1, a_2, \ldots, a_n$ with $1 \leq a_1 \leq a_2 \leq \ldots \leq a_n \leq n$ and $a_k \geq k$ for all $k$.

C. Repeat the Example from the middle of page 270, but this time assume that the cash register starts with a single 50 cent piece (rather than starting empty). We still assume that there are $2n$ people in line to get into the theatre, that admission costs 50 cents, that $n$ of the people in line have a 50 cent piece and $n$ of them have a 1 dollar bill. In how many ways can the people line up so that whenever a person with a 1 dollar bill buys a ticket, the box office has a 50 cent piece in order to make change?

D. Chapter 8, problem 7. Express both $h_n$ and $\sum_{k=0}^{n} h_k$ as polynomials in $n$ in the ordinary way.

E. Chapter 8, problem 8. Express $\sum_{k=1}^{n} k^5$ as a polynomial in $n$ in the ordinary way.

By the way (maybe I shouldn’t have to say this, but it can’t hurt): For problems D and E, a good way to make sure that you haven’t made some arithmetical error en route to your final answer is to check it by plugging in suitable values of $n$. I am often surprised by how few students take the time to do this, even though it’s a quick way to catch mistakes and thereby boost your homework score.