1 Reading.

Chapter 6 (except 6.4–6.7); Chapter 11, Sections 2 and 4.

2 Problems.

1. In class we discussed a linear-time algorithm, build-heap, for building a binary heap from an unordered array. You wisely observed that the algorithm can be improved by skipping over nodes with no children.

   (a) Give a closed-form formula for the first node that should be processed (as a function of \( n \)). I.e., what should \( X \) be in the build-heap algorithm below (input: an unordered array):
   
   - view array as complete binary tree.
   - for \( i = X \) down to 1, percolate-down(\( i \)).

   (b) Prove that your formula is correct.

2. Problem 6.16.


4. Problem 6.31. Hint: first show that \( \binom{k}{d} + \binom{k}{d-1} = \binom{k+1}{d} \) then use induction.