This homework is also based on our discussions of NP-completeness from Chapter 8.

1. Suppose that we have a subroutine that, given any undirected graph $G'$, returns the size of the largest independent set in $G'$. Describe an algorithm (that uses this subroutine) and solves the following problem: given an undirected graph $G$, output the set of vertices in a largest independent set of $G$. The algorithm should run in polynomial time and make at most a polynomial number of calls to the subroutine. We don’t count the running time of the subroutine itself.

2. Exercise 1 of Chapter 8

3. Exercise 2 of Chapter 8

4. Exercise 6 of Chapter 8

The lecture on Monday, April 30, will be useful background for solving the last three problems. The homework is due Friday, May 4, in class; if you can’t make it to class on that day, just make sure you get it to me by that time.