Problem Set 9—Due March 15, 2005

**Problem 9.1.** Page 272, Problem 7.19.

**Problem 9.2.** A graph $G = (V, E)$ is said to be $k$-colorable if there is a way to paint its vertices using colors in $\{1, 2, \ldots, k\}$ such that no adjacent vertices are painted the same color. When $k$ is a number, by $k\text{COLOR}$ we denote the language of (encodings of) $k$-colorable graphs. The language $3\text{COLOR}$ is NP-Complete. (You can assume this.) Use this to prove that the language $4\text{COLOR}$ is NP-Complete, too.

**Problem 9.3.** Page 273, Problem 7.24.