University of Nevada, Las Vegas Computer Science 456/656 Spring 2015

Assignment 9: Due April 9, 2015

Name:_____

You are permitted to work in groups, get help from others, read books, and use the internet. But the handwriting on this document must be your own. You may attach extra sheets, using a stapler. Be sure to write your name on each extra sheet, just in case.

1. Prove that the language 3-SAT is in the class $\mathcal{NP}$-TIME. (Hint: use the "polynomial time verifier" definition.)

2. The answer to the question, "Is $\mathcal{P}$-TIME equal to $\mathcal{NP}$-TIME" is either 1, which means "yes," or 0, which means "no." Does there exist a machine which outputs the correct answer to that question?

3. Prove that the programming language C++ has "Turing power." This means that any computation that can be done by any machine can be done by some C++ program. (You may substitute Java, or whatever other programming language you like, as long as you clear it with Mr. Andro-Vasko.)