Team Assignment 9: Chapter 14. Time Complexity

Due Thursday, April 7

Names: _____   Section: __   Score: ___/50 pts

1. [15 pts] Is $3^n \in \mathcal{O}(2^n)$? Prove your answer. (Problem 14.4 on Page 462)

2. Let L be the language over $\{\ a,\ b\ \}$ that contains a string u if it satisfies one of the following conditions (Problem 14.11 on Page 464):

   (i) $u = a^i b^i$ and length$(u) \leq 100$, or

   (ii) length$(u) > 100$.

   (a) [20 pts] Design a standard TM M that accepts L.
   (b) [10 pts] Give the function tc_M.
   (c) [5 pts] What is the best polynomial rate of growth that describes tc_M?