Homework 8

3 problems, 15 pts, due Wednesday, March 7.

1. (5 pts) Problem 14.14 on page 411. (Show that if \( L \) can be recognized by a multi-tape TM with time-complexity \( f \), then \( L \) can be recognized by a one-tape TM with time-complexity \( O(f^2) \).)

2. (5 pts) Problem 14.16 on page 411. (Show that each solvable decision problem has an encoding such that the corresponding language can be recognized by a TM with linear time complexity.)

3. (5 pts) Problem 14.26 on page 412. (Show that if input tape is “read only” and does not count as “space” then the palindrome and balanced parentheses languages can be decided in using space \( 1 + \lceil \log_2(n + 1) \rceil \).)

Reading: Finish Chapter 14 and start on 15.