CS 4810 Homework Assignment 11 due in class Nov. 19

Your homework will be graded on the neatness of your write up as well as its correctness.

1. Let $h(n)$ be the maximum number of moves that any Turing machine with n states starting on blank tape makes before halting. Is $h(n)$ computable? Give a convincing proof of your answer.

2. List 10 properties of recursive and r.e. sets such as every recursive set is an r.e. set. This can be the first item on your list.

3. Give a short proof for each of your items in the above problem.

4. The halting problem for Turing machines is the the following set:
$$L_H = \{(M, x) | M \text{ halts when started on } x\}.$$
Prove that the halting problem is undecidable. Undecidable means not recursive.

5. Prove that the class of recursive sets is not closed under homomorphisms.