CSE 431
Introduction to Theory of Computation
Homework #3
Due: Friday, April 23, 2010

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1. 5.1
2. 5.2
3. 5.3
4. 5.9
5. A *useless state* in a Turing machine $M = (Q, \Sigma, ...)$ is a state $q \in Q$ such that, for all $w \in \Sigma^*$, q is never entered during the computation of M on w.
   (a) Show that there is no algorithm to decide, given a TM M and a specific state q in M, whether q is useless.
   (b) Show that there is no algorithm to decide, given a TM M, whether M contains a useless state.
6. 5.26