1. Exercise 7.1.
2. Exercise 7.4.
4. Exercise 7.7.
5. Exercise 7.8.
8. Problem 7.15.
9. Let $A$ be the language $\{w \in \{a, b\}^*|w \text{ has twice as many } a\text{'s as } b\text{'s}\}$.

(a) Give an implementation-level description of a one-tape Turing machine that decides the language $A$ in time $O(n^2)$. Give a brief explanation of why your Turing machine runs in time $O(n^2)$.

(b) Give an implementation-level description of a multi-tape Turing machine that decides $A$ in time $O(n)$. 