Review Guide: Chapter 12

Definitions: How are the following terms defined?

- alphabet, string over an alphabet, formal language over an alphabet *(p. 781)*
- Σ^n, Σ^* (the Kleene closure of Σ), and Σ^+ (the positive closure of Σ), where Σ is an alphabet *(p. 781)*
- concatenation of x and y, where x and y are strings *(p. 783)*
- concatenation of L and L', where L and L' are languages *(p. 783)*
- union of L and L', where L and L' are languages *(p. 783)*
- Kleene closure of L , where L is a language *(p. 783)*
- regular expression over an alphabet *(p. 783)*
- language defined by a regular expression *(p. 784)*
- character class *(p. 787)*
- finite-state automaton, next-state function *(p. 793)*
- language accepted by a finite-state automaton *(p. 795)*
- eventual-state function for a finite-state automaton *(p. 797)*
- regular language *(p. 804)*
- $*$-equivalence of states in a finite-state automaton *(p. 809)*
- k-equivalence of states in a finite-state automaton *(p. 810)*
- quotient automaton *(p. 814)*
- equivalent automata *(p. 816)*

Regular Expressions

- What is the order of precedence for the operations in a regular expression? *(p. 784)*
- How do you find the language defined by a regular expression? *(p. 785)*
- Given a language, how do you find a regular expression that defines the language? *(p. 786)*
- What are some practical uses of regular expressions? *(pp. 787-789)*

Finite-State Automata

- How do you construct an annotated next-state table for a finite-state automaton given the transition diagram for the automaton? *(p. 794)*
- How do you construct a transition diagram for a finite-state automaton given its next-state table? *(pp. 794-795)*
- How do you find the state to which a finite-state automaton goes if the characters of a string are input to it? *(p. 796)*
- How do you find the language accepted by a finite-state automaton? *(p. 796)*
- Given a simple formal language, how do you construct a finite-state automaton to accept the language? *(p. 798)*
- How can you use software to simulate the action of a finite-state automaton? *(pp. 799-801)*
- What do the two parts of Kleene's theorem say about the relation between the language accepted by a finite-state automaton and the language defined by a regular expression? *(pp. 799. 803)*
- How can the pigeonhole principle be used to show that a language is not regular? *(p. 804)*
- How do you find the k-equivalence classes for a finite-state automaton? *(p. 811)*
- How do you find the $*$-equivalence classes for a finite-state automaton? *(p. 812)*
- How do you construct the quotient automaton for a finite-state automaton? *(pp. 814-815)*
- What is the relation between the language accepted by a finite-state automaton and the language accepted by the corresponding quotient automaton? *(p. 814)*