Automata Theory: Assignment 7

Due date: November 11 (Thursday)

Problem 1 (6 points)
Consider the following grammar:

$$S \to AB \mid aaB$$
$$A \to a \mid Aa$$
$$B \to b$$

(a) Show that this grammar is ambiguous.

(b) Give a regular expression that describes the same language.

(c) Construct an unambiguous grammar that describes the same language.

Problem 2 (4 points)
For each of the following two grammars, construct an equivalent grammar that has no λ-productions and no unit-productions.

(a) $S \to A \mid B$
$A \to a \mid aA$
$B \to b \mid bB$

(b) $S \to aAb \mid bAa \mid aSb \mid bSa$
$A \to aAa \mid \lambda$