Name_____

CS503 Homework #5

Worked with: _____
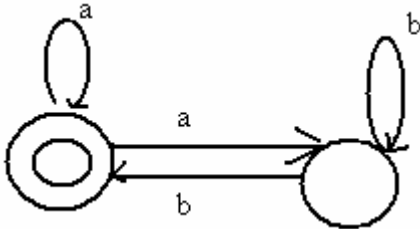
URL's consulted: _____

#1. Show that the following languages are or are not context-free

   a) $\{w\, w^R\, w|\ w\ \varepsilon\ \{a,b\}* \}$

   b) $\{a^i b^{2i} c^j\ |i,j \geq 0\}$

   c) $\{a^n b^n a^n\ |\ n \geq 0\}$

   d) $\{x\ \varepsilon\ \{0,1\}*|\ \#_0(x) = \#_1(x)\}$

#2. For each of the following languages, show it is either a) regular, b) context-free, but not regular, c) not context-free

a) $\{a^n b^m\ |\ n = 2m\}$

b) $\{a^n b^{2m}\ |\ n, m \geq 0 \}$

c) $\{a^n b^m\ |\ n \neq m\}$

#3. a) Use the subset construction to convert the following nfa to a dfa

b) Give a regular expression for L(M)

#4. Prove: CFL's are closed under union, concatenation and Kleene *

#5. Prove: CFL's are not closed under intersection or complement