Name_____

CS503
Homework #4

I worked with:

I consulted:

#1. a) Given the following PDA, M:

$Q = \{q_0, q_1, q_2\}$
$\Sigma = \{a,b\}$
$\Gamma = \{A\}$
$F = \{q_1, q_2\}$

$\delta(q_0,a,\lambda) = \{[q_0,A]\}$
$\delta(q_0, \lambda,\lambda) = \{[q_1, \lambda]\}$
$\delta(q_0,b,A) = \{[q_2, \lambda]\}$
$\delta(q_1, \lambda,A) = \{[q_1, \lambda]\}$
$\delta(q_2, b,A) = \{[q_2, \lambda]\}$
$\delta(q_2, \lambda,A) = \{[q_2, \lambda]\}$

a) Draw the graph for M

b) Trace the computations of *aab, abb, aba, aabb*

b) What is L(M)?

#2. a) Construct a PDA to accept $\{a^n b^{2n} \mid n \geq 0\}$

b) Show computations on *a a b* and *a b b*

#3. Show context free languages are closed under reversal. Show your method on $\{ab^n \mid n \geq 0\}$

#4. a) Given G is in Chomsky Normal form, prove using induction that length(derivation) = 2n-1 when |w| = n

#5. Convert your grammar for L from problem #3 (before reversal) above to a PDA using the technique in the book. Show both a derivation and a computation of *a b b*