Note: The homework is the same for both sections. It will not be handed in. However, you are strongly encouraged to do the homework in order to prepare for the second quiz on November 6. The quiz will contain similar problems.

1) #2.2
2) #2.4 (a,c,d,e)
3) #2.5 (d,e)
4) #2.6 (a,b)
5) #2.9
6) #2.15
7) #2.18 (a,b)
8) #3.1 (a,c)
9) #3.2 (b,d)
10) #3.8 (b,c)

11) Convert the following CFG to Chomsky Normal Form. (The set of variables for the grammar is $V = \{R, S, T, X\}$ and the set of terminals is $\Sigma = \{a, b\}$.)

\[
R \rightarrow XRX \mid S \\
S \rightarrow aTa \mid bTa \\
T \rightarrow X \\
X \rightarrow a \mid b
\]

12) Draw the state diagram for a PDA recognizing the language

\[
L = \{a^ib^jc^k \mid i, j, k \geq 0 \text{ and } i + j < k\}.
\]

(Here the input alphabet is $\Sigma = \{a, b, c\}.$)