Problem Set 1

NOTE: All problems are from the 2nd edition of the textbook.

0.1 Read and solve, but do not turn in: Book, 2.18 .  [CFL $\cap$ regular = CFL]
You can check your solution with the one in the book.

0.2 Read and solve, but do not turn in: Book, 2.26 .  [Chomsky normal form]

1. Book, 1.32 .  [parallel addition]

2. Book, 1.41 .  [regular closure under perfect shuffle]

3. Book, 1.53 .  [sequential addition]

4. Book, 1.60 .  [small NFA for: $\{w | w$ contains an $a$ which is exactly $k$ places from the end}$]

5. Book, 1.61 .  [any DFA for above language must be large]

6. Book, 2.24 .  [very tricky CFL]
Think about this language in a different way.

7. Book, 2.27 .  [if-then-else ambiguous grammar]
You do not need to prove your grammar works, but adding a few comments about why it does work might help the grader.

8.* (optional) Book, 1.59 .  [synchronizing sequence]