1. Problem 1.7.5, part (d), from the text, page 46. Note that in this problem $u$ can depend on $w$.

2. Rewrite each of these regular expressions as a simpler expression representing the same set.
   (a) $b^* \cup a^* \cup (a \cup b)^*$
   (b) $((a^*b^*)^*(b^* \cup a^*)^*)^*$

3. Let $\Sigma = \{a, b, c\}$. Write a regular expression for the set of all strings in $\Sigma^*$ such that the sum of the number of $a$’s and $b$’s in the string is at most two. Thus the string can have an $a$ and a $b$ but cannot have two $a$’s and a $b$, for example.