1. Problem 2.3.7, part (b), from the text, page 84. You need not use the construction of example 2.3.2, just come up with a regular expression for this automaton and illustrate how you got it.

2. Using the pumping theorem and closure under intersection, show that the language $L = \{wbbw : w \in \{a, b\}^*\}$ is not regular. (Hint: Intersect $L$ with the regular language denoted by $a^*bba^*$. The intersection gives the language $\{a^n bba^n : n \geq 0\}$. This language would be regular if $L$ were regular. To show that $L$ is not regular, you only have to show that $\{a^n bba^n : n \geq 0\}$ is not regular, and you can do this using the pumping lemma.

3. Find a regular language $L$ and a non-regular subset $S$ of $L$. 