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 \( \{a^nbbac^n : n \geq 0\} \). This language would be regular if \( L \) were regular. To show that \( L \) is not regular, you only have to show that \( \{a^nbbac^n : n \geq 0\} \) 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 \( L \).