Problems:

1. Problem 4 from tutorial 3, given below for convenience:
   Show that if L is a regular language, then so is L' formed by taking only the words starting with a and deleting it:
   $$L' = \{w \in \Sigma^* | aw \in L\}.$$

2. Given a DFA M, how can you determine if $L(M) = \phi$?

3. Given DFA's M_1, M_2, how can you determine if $L(M_1) = L(M_2)$?

4. Is the language $L = \{0^{3m+4n} | m, n \geq 0\}$ regular?

5. Is the language $L = \{10^m + 10^n + 1 | m > n > 0\}$ regular? Note that 10^m in this question is an integer operation and not a string of 1 followed by m zeroes.

6. Is the language $L = \{10^{2n} + 10^n + 1 | n > 0\}$ regular? Note that 10^m in this question is an integer operation and not a string of 1 followed by m zeroes.

7. Show that the language $L = \{a^n b^{2n} | n \geq 0\}$ is not regular.

8. Show that the language $L = \{a^n b^n c^n | n \geq 0\}$ is not regular.