1. For the alphabet \{x, y, z\},
   let \( L \) be the language of nonempty strings \( w \) such that
   \( w \) starts with the symbol \( x \) and contains exactly one \( y \), or
   \( w \) starts with the symbol \( y \) and ends with the symbol \( z \), or
   \( w \) starts with the symbol \( z \) and the total length is odd. Give an FA for \( L \).
2. Give an RE for the set of all binary strings of odd length whose first and last bits are the same.

\[ \sum (\sum)^* 0 + 1 \sum (\sum)^* 1 + 0 + 1 \]

3. Give an RE for the complement of the language defined by the following RE: \((01)^*\)

\[ \sum^* + \sum^* 0 + \sum^* 00 \sum^* + \sum^* 11 \sum^* \]

4. Consider the following FA.

(a) Give two strings of length 4 accepted by the FA.

(b) Give two strings of length 4 NOT accepted by the FA.

(c) Describe in succinct-ish English the language of this FA. Be precise.

\[ \text{Alphabet} = \{a, b\} \]

Must start with a and except for last symbol must alternate.