Quiz 1

1. List, in lexicographic order, the first five strings of $\{aa, b\}^*$.

2. Draw a smallest DFA that accepts $L = \{x \in \{0,1\}^* :$ the number that x represents, in binary, is divisible by 3$\} = \{0\}^*\{\varepsilon, 11, 110, 1001, \ldots\}$. (smallest = fewest states)

3. Draw a smallest NFA for the language $L = \{01, 001\}$.

4. Every NFA-acceptable language can be accepted by an NFA with just a single final state.

5. L^* is infinite.

6. $(L^*)^* = L^*$.

7. If $M = (Q, \Sigma, \delta, q_0, F)$ is a DFA and $F = Q$ then $L(M) = \Sigma^*$.

8. If L is accepted by an n-state NFA then L is accepted by some $2 + 2^n$-state DFA.

9. If L is DFA-acceptable and F is finite then $L \cap F$ is a DFA-acceptable.

10. Let $M = (Q, \{0,1\}, \delta, q_0, F)$ be a DFA and suppose that $\delta^*(q_0, x) = \delta^*(q_0, y)$. Let $z \in \{0,1\}^*$. Then $xz \in L(M)$ iff $yz \in L(M)$.