1 Instructions

1. Attempt as many problems as you can. You will be given partial credit.

2 Problems

1. Design a DFA to accept the language $L$, where
   $L = \{w \mid w \in \{0, 1\}^*, \text{ $w$ is divisible by 3, when interpreted as a binary number}\}$. (3 points)

2. Convert the NFA in Figure (1) to a DFA. (3 points)

![Figure 1: NFA](image)

3. Convert the regular expression $01^* + (0 + 1)^*$ into an $\epsilon$-NFA. (3 points)

4. Let $\Sigma = \{0, 1, 2\}$ be an alphabet. Write a regular expression to accept all strings over $\Sigma^*$, such that the third symbol from the right is 1 or 2, but not 0. (1 point)