1. Construct an NFA that accepts all binary strings that have a 1 as the third-last character; i.e., $x1ab$ for $a, b \in \{0, 1\}, x \in \{0, 1\}^*$

For the next problems, write out a formal definition of the new NFA $N'$.

2. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA $N'$ that accepts all prefixes of $L(N)$, i.e., $w \in L(N') \iff wx \in L(N)$ for some $x \in \Sigma^*$.

3. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA $N'$ that accepts all suffixes of $L(N)$, i.e., $w \in L(N') \iff xw \in L(N)$ for some $x \in \Sigma^*$.

4. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA $N'$ that accepts $\text{insert}_1(L(N))$, i.e., strings from $L(N)$ with a 1 inserted somewhere. In other words $x \in L(N')$ if $x = y1z$ for some $y, z \in \Sigma^*$ and $yz \in L(N)$.

5. Given an NFA $N = (\Sigma, Q, \delta, s, A)$, construct an NFA $N'$ that accepts the reverse of $L(N)$, i.e., $w \in L(N') \iff w^R \in L(N)$. 
