Exercise 3.   Due by class time Thursday
October 17.

1. Recall that the ε-closure of a state is every
    state reachable from that state on ε-
    transitions alone. Compute the ε-closure
    of each of the states in the ε-NFA below.

2. If we convert the ε-NFA shown to the right
    to a DFA using the construction of
    Theorem 1.39, what is the upper bound on
    the number of states in the constructed
    DFA? In general, if the NFA has n states
    how many states does the constructed DFA
    have in the worst case?

3. Guess a regular expression equivalent to the
    ε-NFA to the right. Explain your reasoning.

4. Given the ε-NFA to the right, give an
    equivalent NFA with no epsilon transitions.
    (This is not exactly following an algorithm
    from text or lecture, but it uses elements
    of the NFA to DFA construction and
    problem 1 of this exercise.)