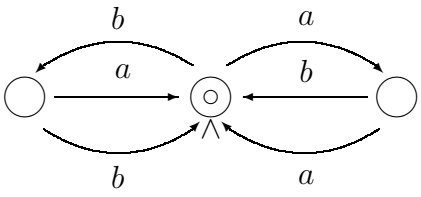
Math 166A Exam Spring Quarter June 1991 Buss

(1) Convert the following DFA into a regular expression.



(2) Convert the following NFA into an equivalent DFA

(3) Show that $\{a^i b^j c^k : i + j = k, i, j, k \geq 0\}$ is a CFL.

(4) Convert this NFA to DFA.

(5) Prove or disprove: $\{a^i b^j : i \leq j$ or i is a perfect square$\}$ is not regular.

(6) Give a CFG G_1 such that $L(G_1) = (a \cup b)^*(b \cup c)^*$.

(7) Prove that if L_1 is a regular language then $L_2 = \{w : w^R \in L_1\}$ is regular. [Hint: Two approaches are possible: (1) induction on regular expressions or (2) convert on FA for L_1 into an DFA for L_2.]