

Homework 8

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4.1.1 (a)

Starting with input tape: $(q_0, \triangleright \underline{a}abbab)$. We have $(q_1, \triangleright \underline{b}abbab)$, $(q_0, \triangleright b\underline{a}bbab)$,
 $(q_1, \triangleright bbb\underline{b}ab)$, $(q_0, \triangleright bbb\underline{b}ab)$, $(q_1, \triangleright bb\underline{a}bab)$, $(q_0, \triangleright bba\underline{b}ab)$, $(q_1, \triangleright bba\underline{a}ab)$,
 $(q_0, \triangleright bbaa\underline{a}b)$, $(q_1, \triangleright bbaa\underline{b}b)$, $(q_0, \triangleright bbaab\underline{b})$, $(q_1, \triangleright bbaab\underline{a})$, $(q_0, \triangleright bbaaba)$

(b) Very simply, M inverts the tape. That is, it replaces all 'a's with 'b's and vice versa.

4.2.2 (c)

(d)