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HW#10
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1) a) On input string w , a $\$$ is placed to signify the starting of the language. Go across the tape on either sides of the $\$$. If these two numbers contain different values, reject, otherwise continue. When all of the symbols on the left are crossed off, check for any on the right, if empty, then accept, otherwise reject.

b) A $\$$ is placed to signify the starting of the language. Scan the input and determine its length. If length is ≥ 2 , then continue, otherwise reject. Return to left hand side. Cross off an 'a', if there is an 'a', continue, otherwise reject. For each 'a' cross out a 'b' and 'c'. If there are any 'a's remaining, then reject, otherwise accept.

2) a) Let $L = \{w \in \{a, b\}^* \mid \text{At least 1 a, b, or c}\}$

b) $M =$ On input $\langle B, w \rangle$, where B is a DFA and w is a string, Simulate B input on w .
(check if the first character is "a", "b", or "c". If true then accept, otherwise reject.

3) a) $S \rightarrow \epsilon A \epsilon \mid A$
 $A \rightarrow \epsilon$

b) $S =$ On input $\langle G, w \rangle$, where G is a CFG and w is a string.
(homski, Normal form: $S \rightarrow \epsilon A \epsilon \mid \epsilon$
All derivations: $\epsilon \epsilon \epsilon, \epsilon$
These derivations produce ϵ , accept.