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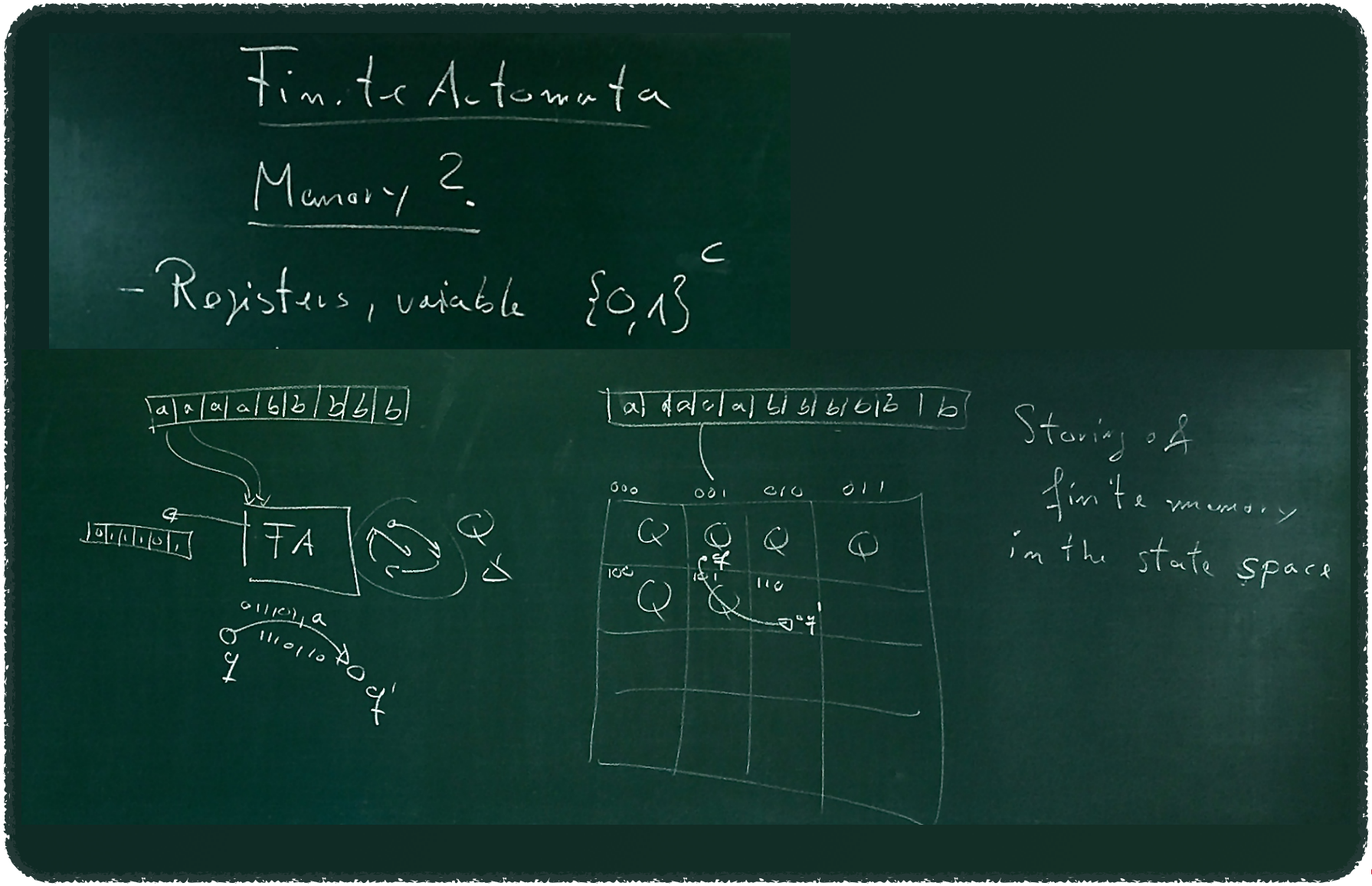
2. Memory, Tapes and TMs



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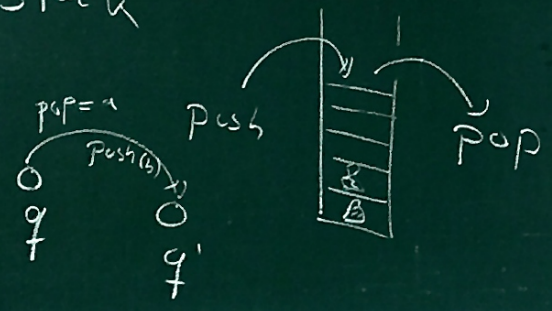
2. Memory, Tapes and TMs

Finite Automata

Memory 2.

- Registers, variable $\{0,1\}^c$
- stack



- FA + stack $\subseteq$ CFL (context-free languages)

det. Pushdown-Automata

$L = \{a^n b^n c^n \mid n \in \mathbb{N}\}$

$\{ww \mid w \in \Sigma^*\}$ = COPY

- FA + 2 stacks
- + infinite tape

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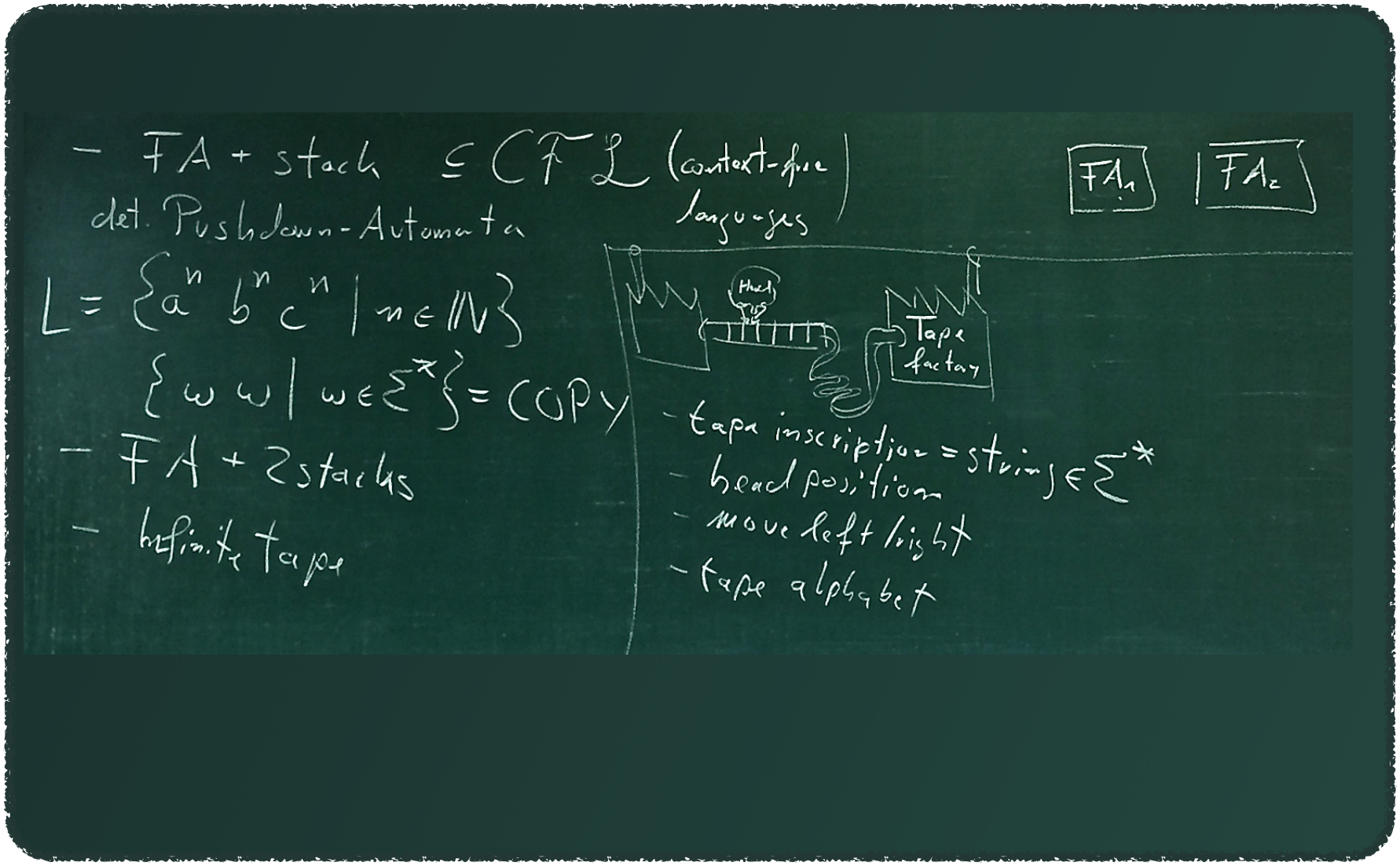
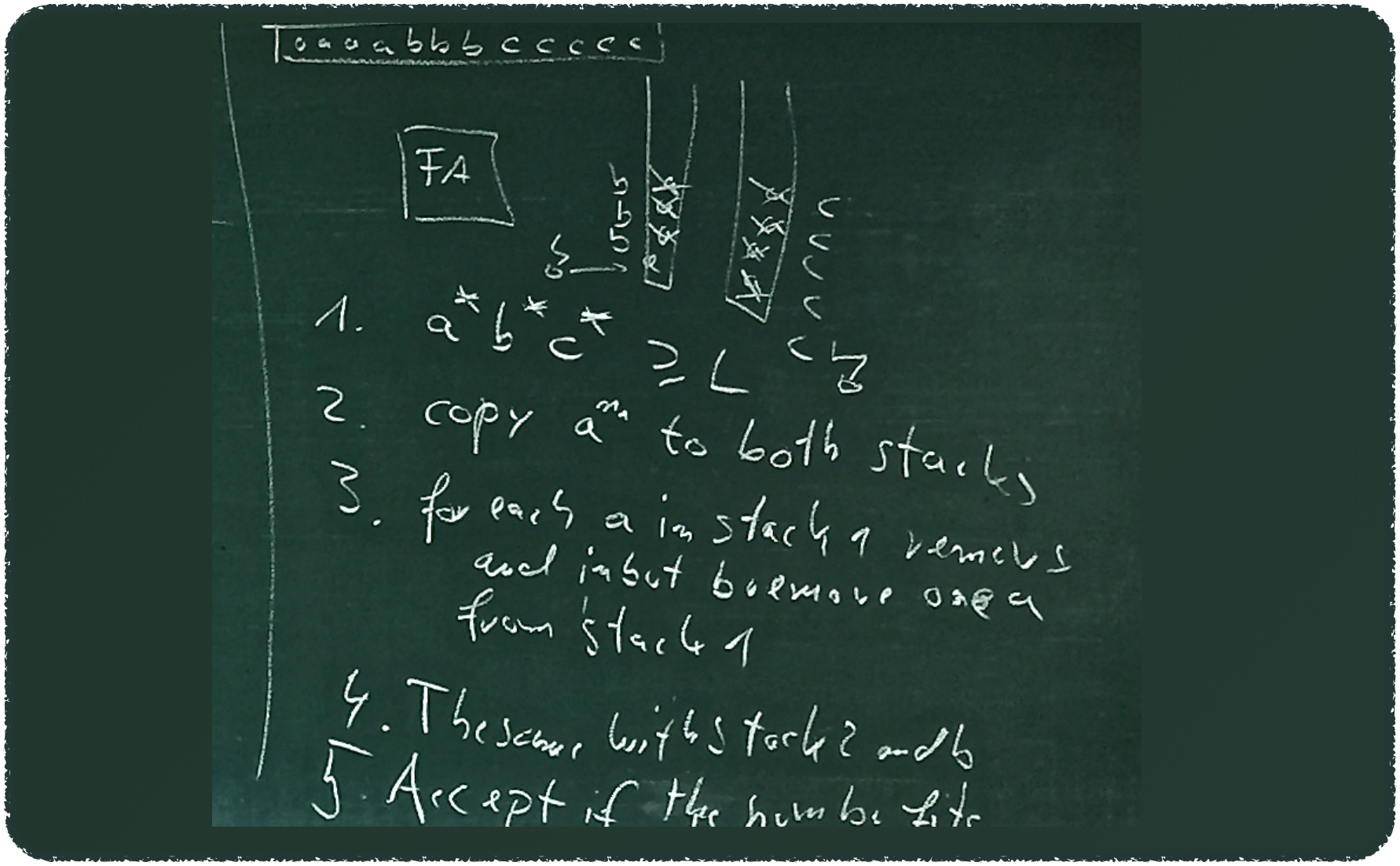
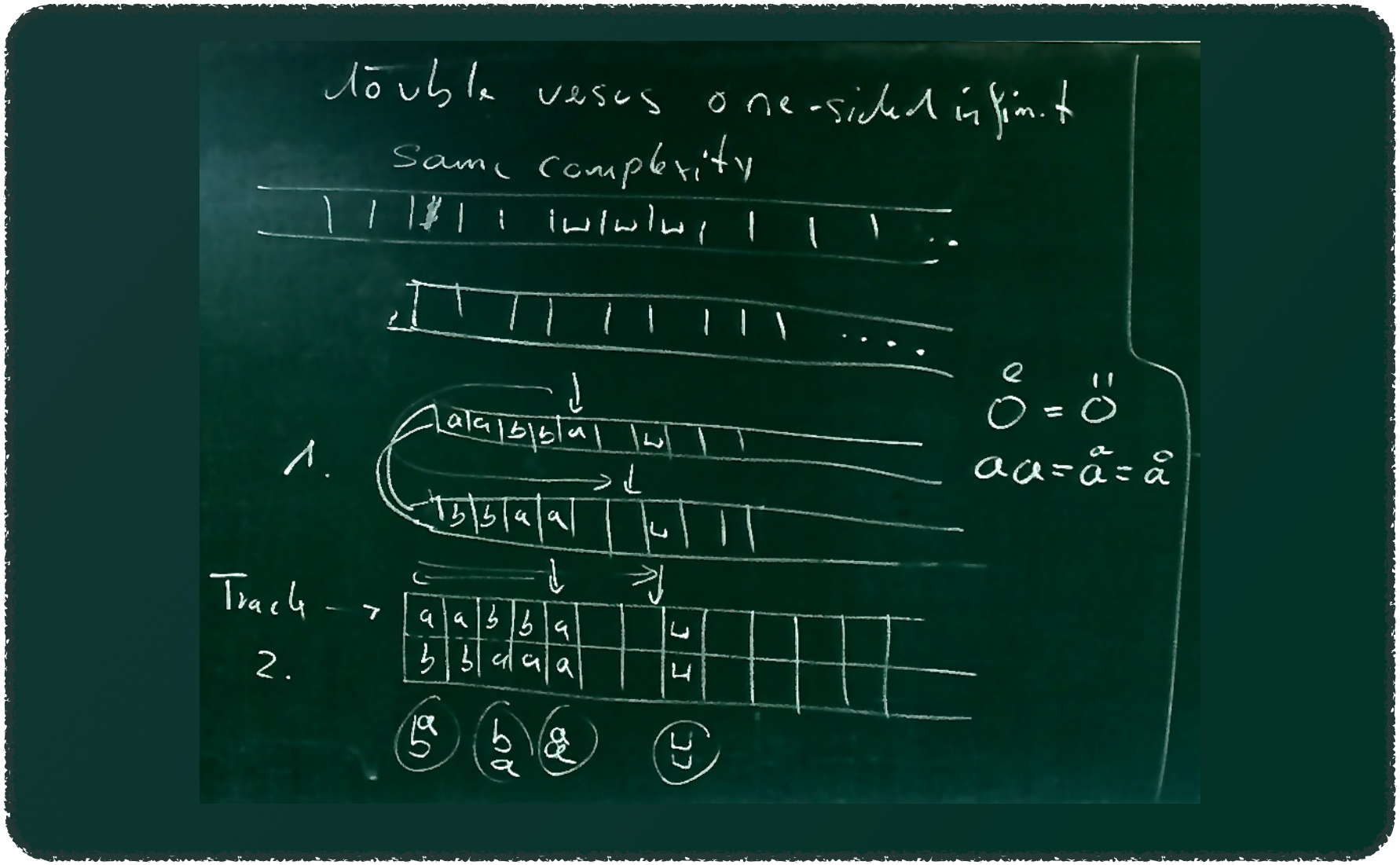
2. Memory, Tapes and TMs



2. Memory, Tapes and TMs



2. Memory, Tapes and TMs



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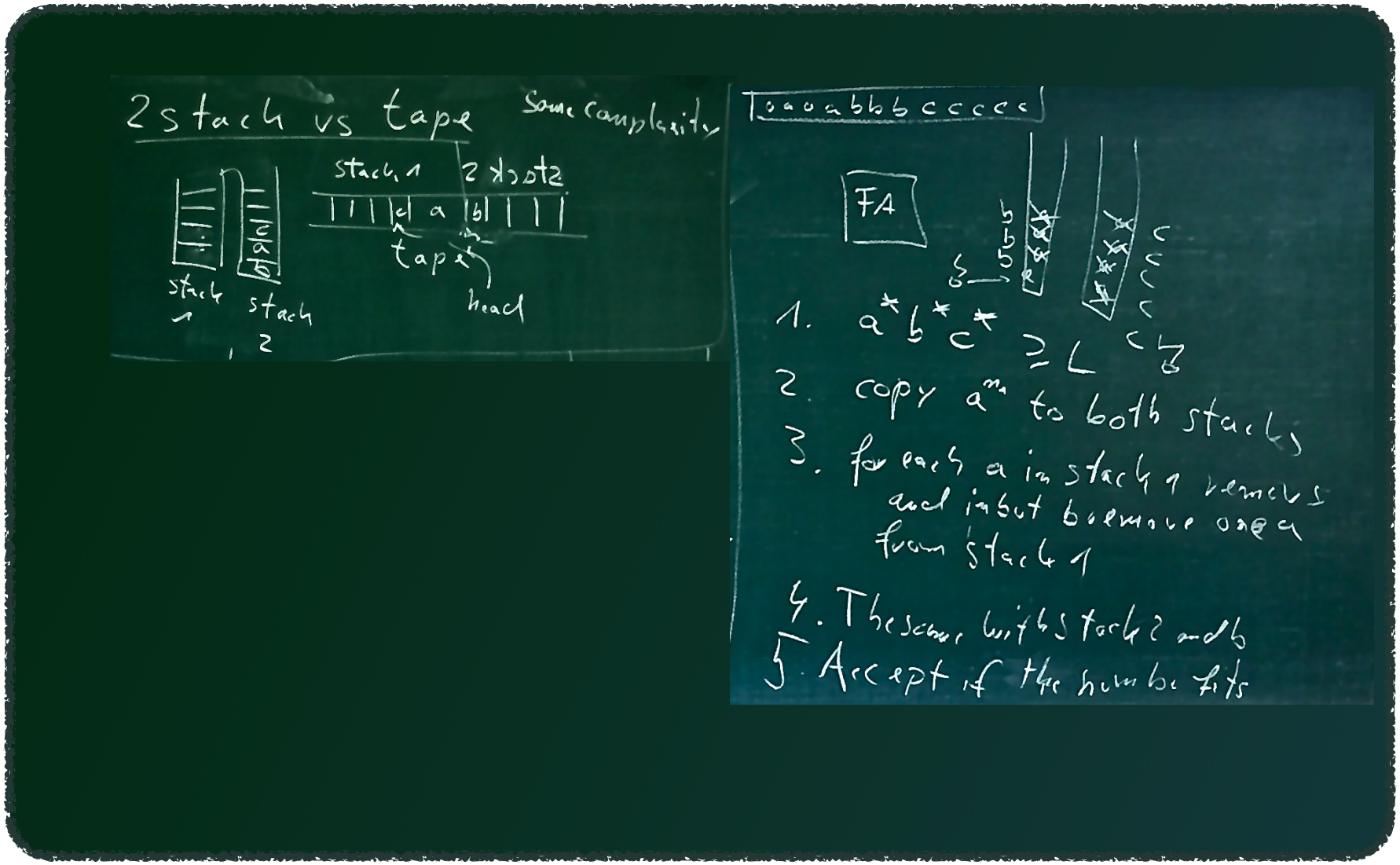
2. Memory, Tapes and TMs



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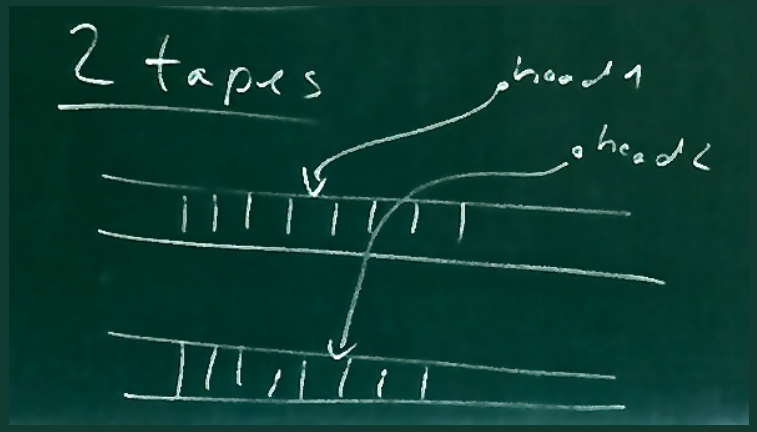
2. Memory, Tapes and TMs

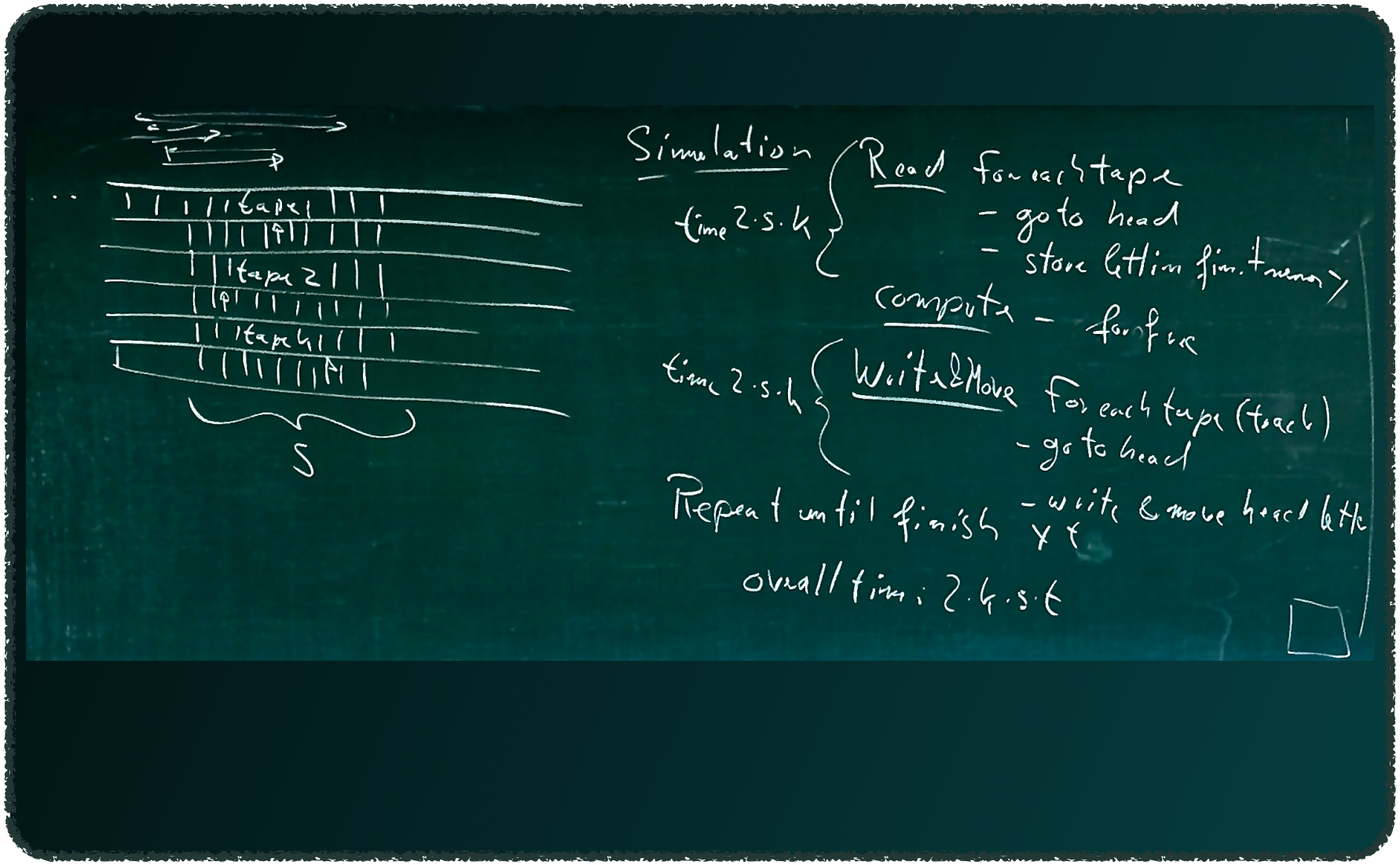
Lemma Every TM with k tapes with time t and space s can be simulated by a 1 tape TM in time $2 \cdot k \cdot s \cdot t$ and space s.



Proof

1. one tape with k tracks (copies of the k tapes) + special marks for the head (on k tapes)

2. Memory, Tapes and TMs



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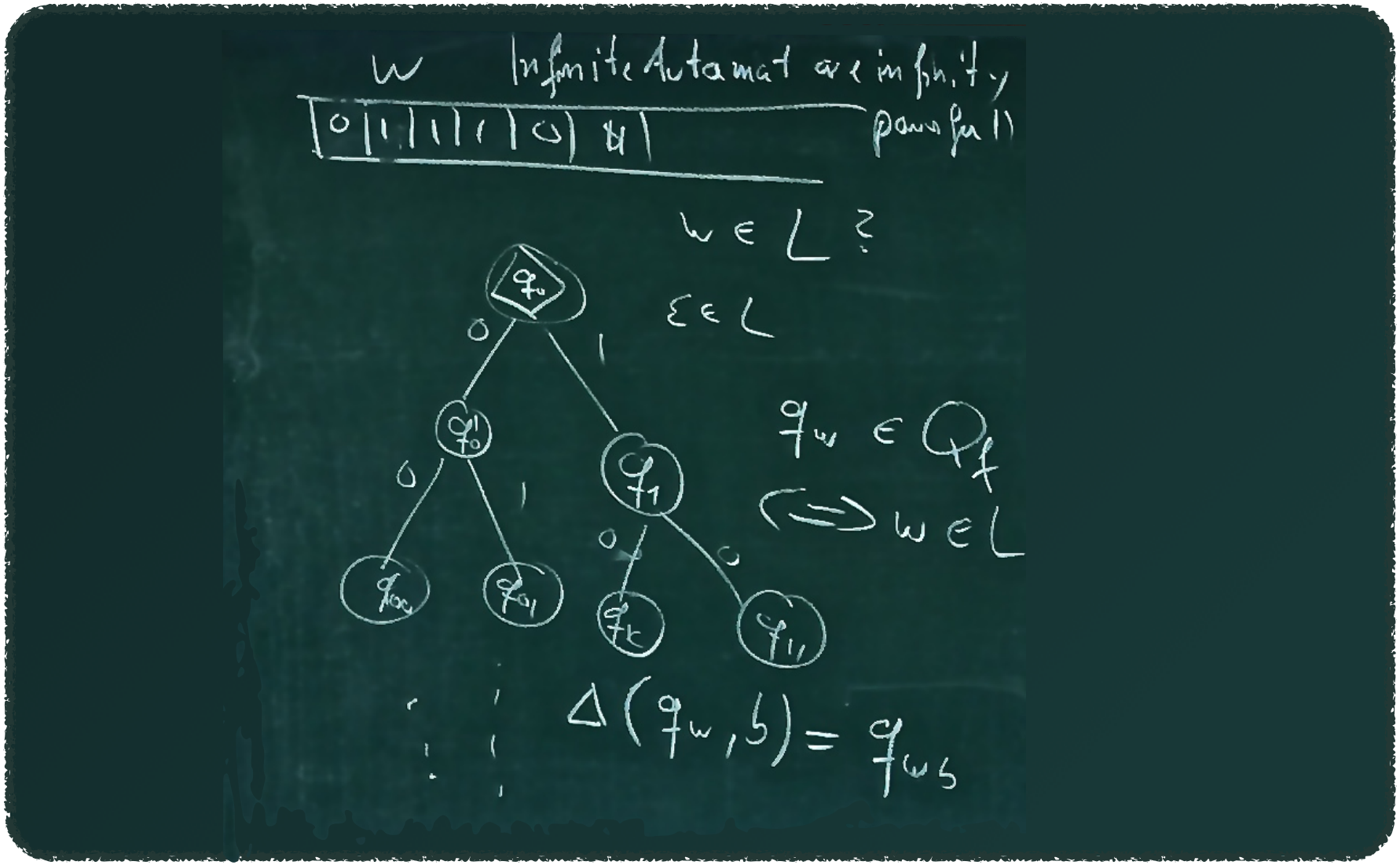
2. Memory, Tapes and TMs



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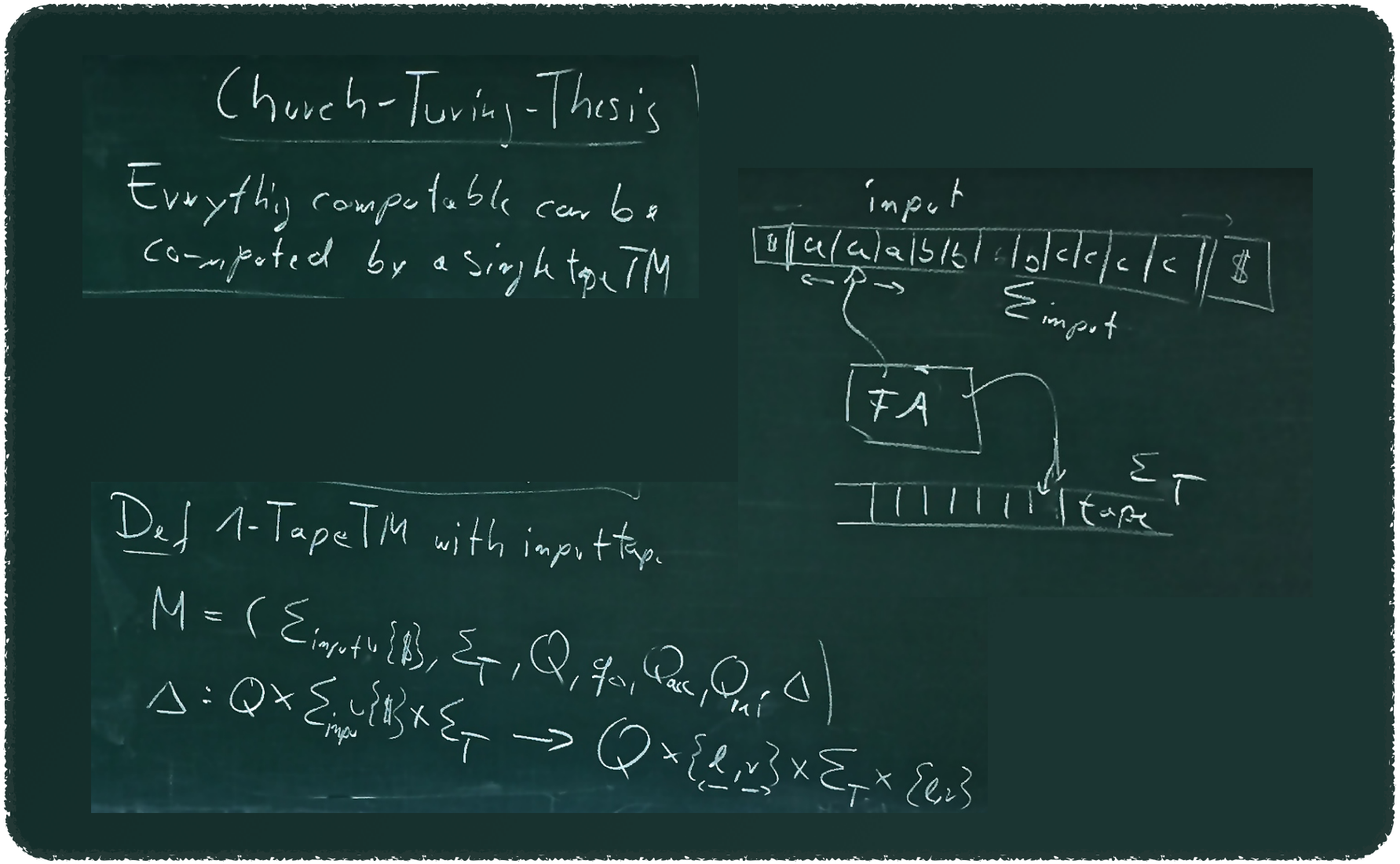
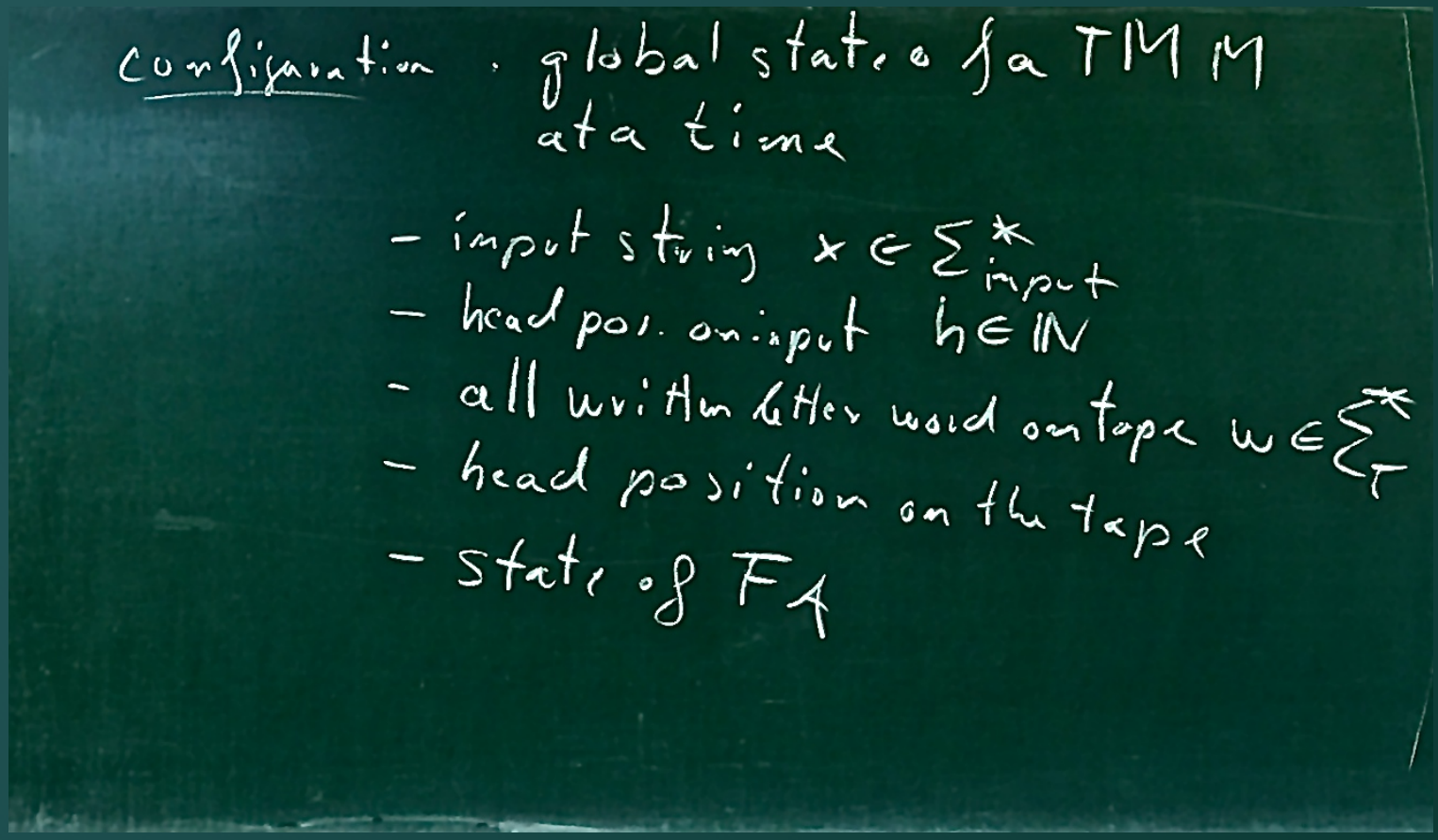


2. Memory, Tapes and TMs



2. Memory, Tapes and TMs