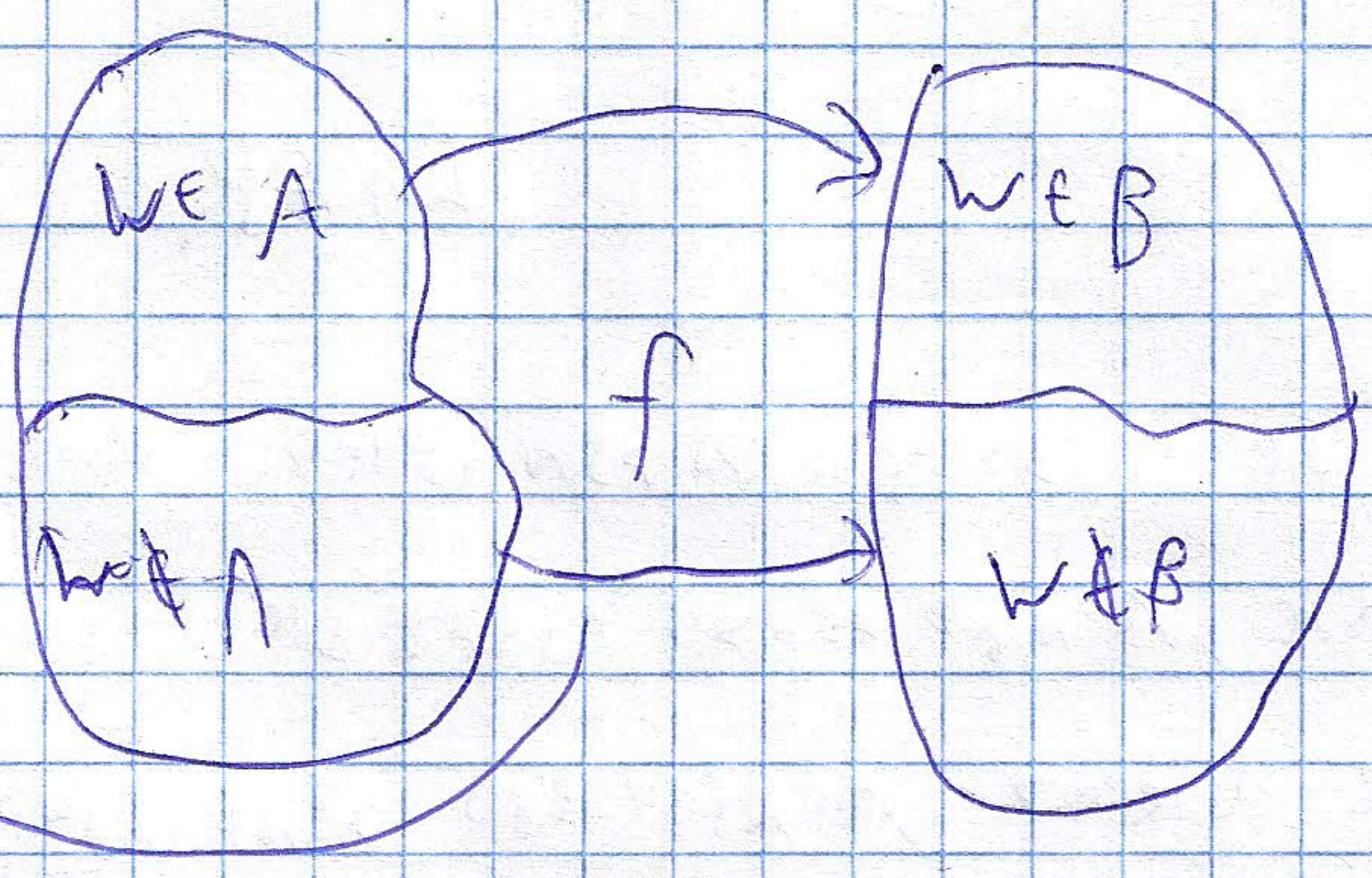


$$P P^{-1} = P^t \quad P = P^t$$

10 from origin

~~$P P^{-1} = P^t$~~
 ~~$P = P^t$~~
 ~~$P P^{-1} P^{-1} = (P^{-1})^t$~~
 ~~$P^{-1} = (P^{-1})^t$~~



for 108
 (from 108, 108, 108, 108, 108)

$$f: \Sigma^* \rightarrow \Sigma^*$$

given via f

$B \subseteq A$ $\sim$ '108' $\sim$ 108, 108, 108, 108, 108 $\sim$ 108, 108, 108, 108, 108 $\sim$ 108, 108, 108, 108, 108 $\sim$ 108, 108, 108, 108, 108

$$w \in A \iff f(w) \in B$$

$$A \leq_m B$$

$$A \in R \text{ s.t. } B \in R \quad A \leq_m B \quad \text{w.l.o.}$$

$$R \text{ r.e. } B \quad \text{w.l.o. } A \notin R \quad \text{w.l.o.}$$

co-RE $\neq$ RE $\neq$ ~~co-RE~~ $\neq$ RE

$$\begin{matrix} \text{RE} \\ \text{co-RE} \\ R \end{matrix} \ni A_{T_m} = \{ \langle m, w \rangle \mid w \in T_m \}$$

$$\begin{matrix} \text{RE} \\ \text{co-RE} \\ R \end{matrix} \ni H_{T_m} = \{ \langle m, w \rangle \mid w \in T_m \}$$

$$\begin{matrix} \text{RE} \\ \text{co-RE} \\ R \end{matrix} \ni H_E = \{ \langle m \rangle \mid m \in E \}$$

$$A_{T_m} \leq_m H_{T_m} \leq_m H_E$$

$$L_\infty = \{ \langle M \rangle \mid |L(M)| = \infty \}$$

$$L_\infty \notin RE \cup co-RE \quad (10.3)$$

(10.3) ~~א~~

$$A_{TM} \leq_m L_\infty \rightarrow L_\infty \notin co-RE$$

$$A_{TM} \leq_m \bar{L}_\infty = L_\infty \notin RE$$

(10)

$\langle M, w \rangle$

$\Downarrow$

$\langle M_w \rangle$

$\sim$ $\langle M, w \rangle$ $\sim$ $\langle M, w \rangle$ M

$\Downarrow$

$\sim$ $\langle M, w \rangle$ $L(M_w)$

M_w

$\sim$ M_w

$\sim$ M_w

M_w

$\sim$

M_w

$\sim$

M_w

M_w

M_w

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M_w

$M_w \in L(M_w) \iff \langle M, w \rangle \in A_{TM}$

$\iff$

$\langle M, w \rangle \in A_{TM}$

$$\infty = |\Sigma^*| = |L(M_w)|$$

$\sim$ $\langle M, w \rangle \in A_{TM}$

$\sim$

$$A_{TM} \leq_m \bar{L}_\infty$$

M_w

M_w

$\langle M, w \rangle$

M_w

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$$L(m'_{\omega}) = \{x \in \Sigma^* \mid |x| < k\}$$

$$\rightarrow |L(m'_{\omega})| < \infty$$

$$\Rightarrow f(m, \omega) = \langle m'_{\omega} \rangle \in \mathbb{I}_{\infty}$$