

RECALL DEF of $L \in NP$:

(*) $x \in L \iff \exists y (|y| \leq |x|^c) R(x, y)$

DEFINE

MACHINE $M(e, x, y, z)$

- \leq inputs

(i) M simulates machine e on (x, y) for time $|z|$

(ii) IF THE SIMULATION STOPS, IT STOPS TOO WITH THE SAME OUTPUT

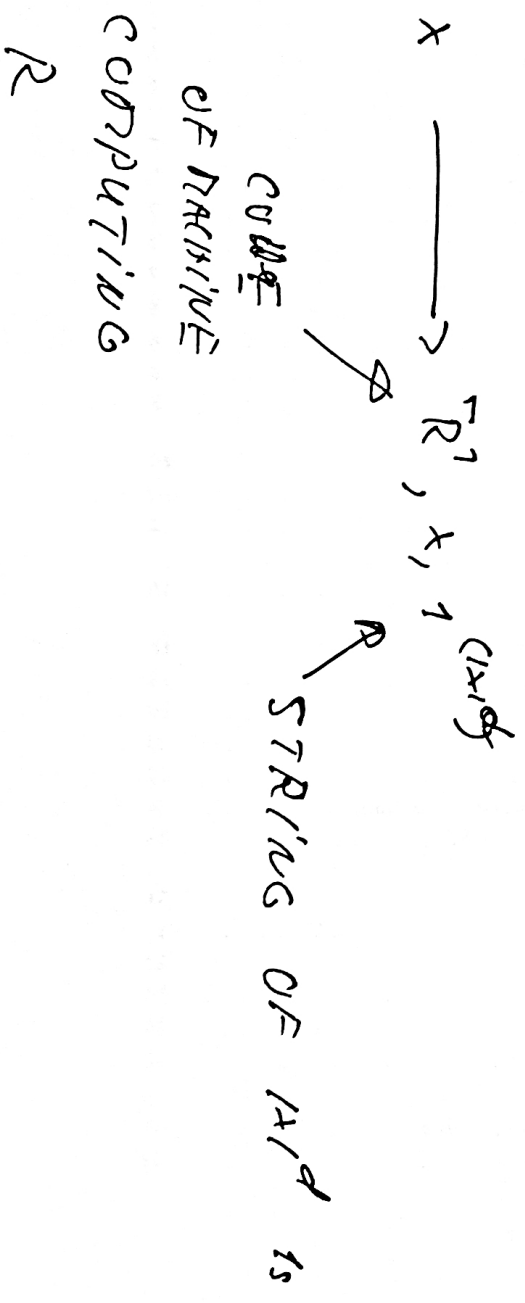
(iii) IF NOT, IT STOPS AFTER $|z|$ STEPS WITH OUTPUT 0.

CLAIM 1: U is P-TIME.

CLAIM 2: $L_U := \{ (e, t, z) \mid \exists y (|y| \leq |z|) U(e, t, y, z) = 1 \} \in \mathcal{N} \cap$

CLAIM 3: ANY L DERIVED AS $ic(\Phi)$ IS P-REDUCIBLE TO L_U

PRF: REDUCTION f :



WHERE $also$ IS SUCH THAT R IS COMPUTED IN TIME $\leq poly(|x|)$. \square