Ex 1 Show that $L^* = L^{**}$

$L^* \subseteq L^{**}$ because L^{**} has $(L^*)^1$.

L^{**}

$= \{x : \exists k \cdot x \in (L^*)^k \}$

show that $\forall k \geq 1 \cdot (L^*)^k = L^*$

for $y \in (L^*)^k$

$y \in L^{0^k} \vee L^{1^k} \vee L^{2^k} \vee \ldots L^{p^k}$

$$L^{p^k} = L^{pk}$$

$y \in L^{pk} \Rightarrow y \in L^*$.

Ex 2

Let $M = \{\varepsilon, a, b\}$

Show that

$$M \neq MM$$

Ex 3

Show that

(a) If $\varepsilon \notin L$

then $L \neq LL$

(b) If $\{\varepsilon, a, b\} \subseteq L$ then

$L = LL$ iff $L = \{a, b\}^*$