Salces / Ruben Darío

Montaño

PRACTICO EJERCICIOS

1. Demostrar: a) $|w^n| = n|w|$

prueba $L = \{w \in \Sigma^* / |w^n| = n|w|\}$

i) $\lambda \in L$?

$\lambda^n = \lambda \Rightarrow |\lambda^n| = |\lambda| = n \cdot |\lambda| \therefore \lambda \in L$

ii) p.d. $w \in L \wedge a \in \Sigma \Rightarrow wa \in L$

Suponemos $w \in L \wedge a \in \Sigma \Rightarrow |w^n| = n|w| \wedge a \in \Sigma$

p.d. $wa \in L$

$|(wa)^n| = |w^n a^n| = |w^n| + |a^n| = n|w| + n|a| =$

$= n(|w| + |a|)$

$= n|wa|$

$\therefore wa \in L$

entonces $L = \Sigma^*$

b) $(w^n)^m = w^{nm}$

prueba $L = \{w \in \Sigma^* / (w^n)^m = w^{nm}\}$

i) $\lambda \in L$?

$(\lambda^n)^m = \lambda^m = \lambda = \lambda^n = \lambda^{n \cdot m} \therefore \lambda \in L$

ii) p.d. $w \in L \wedge a \in \Sigma \Rightarrow wa \in L$

Suponemos $w \in L \wedge a \in \Sigma \Rightarrow (w^n)^m = w^{nm} \wedge a \in \Sigma$

p.d. $wa \in L$

$((wa)^n)^m = (w^n a^n)^m = w^{nm} a^{nm} = wa^{nm}$

$\therefore wa \in L$

entonces $L = \Sigma^*$

c) $w^n w^m = w^{n+m}$

prueba $L = \{w \in \Sigma^* / w^n w^m = w^{n+m}\}$

i) $\lambda \in L$?

$\lambda^n \lambda^m = \lambda \lambda = \lambda = \lambda^n = \lambda^{n+m} \therefore \lambda \in L$