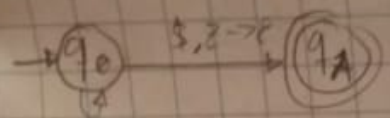
# Tarea 22

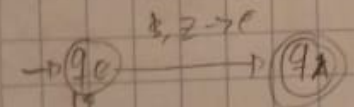
1.- Construya los APNs que permitan aceptar a cada uno de los siguientes lenguajes:

a) $L = \{ w \in \{a,b\}^* \mid N_a(w) > N_b(w) \}$ $x = a$, $x = aab$, $x = aabab$, $x = abaa$




$a, Z \to AZ$
$a, A \to AA$
$b, Z \to BZ$
$b, B \to BB$
$a, B \to \varepsilon$
$b, A \to \varepsilon$

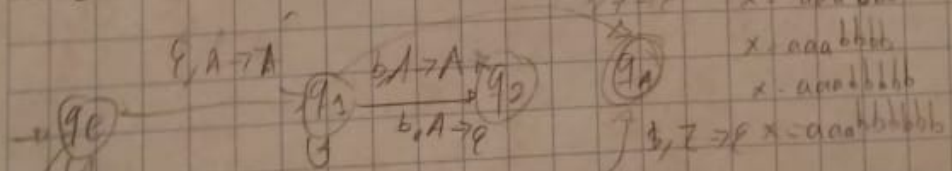
b) $L = \{ w \in \{a,b\}^* \mid N_a(w) = 2N_b(w) \}$ $x = abb$, $x = aabbbb$




$a, Z \to AAZ$
$a, A \to AA$
$a, B \to A$
$b, Z \to BZ$
$b, B \to BB$
$b, A \to \varepsilon$

$x = \varepsilon$
$x = ab$

c) $L = \{ a^m b^n \mid 0 \leq m \leq n \leq 2m \}$ $x = aabb$, $x = aabbb$, $x = aaabbbb$, $x = aaabbbbb$




$a, Z \to AZ$
$a, A \to AA$
$b, A \to \varepsilon$

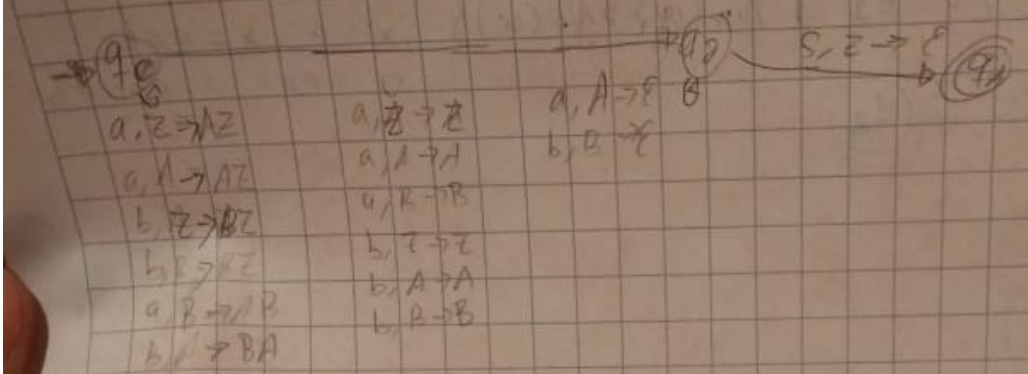
b) $L = \{ \omega \in \{a,b\}^* \mid \omega = \omega^R \text{ y } |\omega| \text{ es impar} \}$

$S \to aSa \mid bSb \mid a \mid b$

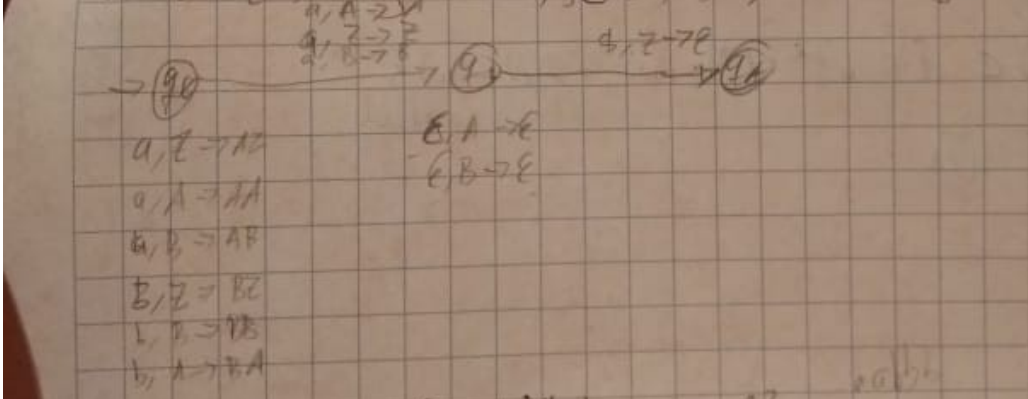
$x = aba$, $x = aaa$, $x = a$

$x = bab$ $x = bbb$

$x = baab$ $x = b$




c) $L = \{ x a y b \mid x, y \in \{a,b\}^*, |x| = |y| \}$




f) $L = \{ \omega \in \{a,b\}^* \mid \omega \neq \omega^R \}$