3.3. EQUIVALENCIAS

3.3.1. GIC $\Rightarrow$ AA

GIC   **AA**

$G = (N, \Sigma, P, S) \quad \Rightarrow \quad A = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, \emptyset)$

$$\text{donde} \begin{cases} Q = \{q_0\} \\ \Gamma = N \cup \Sigma \\ \delta \begin{cases} \delta(q_0, \varepsilon, A) = \{(q_0, \alpha) \: / \: A \to \alpha \in P\} & \forall A \in N \\ \delta(q_0, \sigma, \sigma) = \{(q_0, \varepsilon)\} & \forall \sigma \in \Sigma \end{cases} \\ Z_0 = S \end{cases}$$

Ejemplo:
$G = (\{E, I\}, \{+, *, (,), a, b, 0, 1\}, P, E)$
$P = \{$

     $E \to I \mid E+E \mid E*E \mid (E)$

     $I \to a \mid b \mid Ia \mid Ib \mid I0 \mid I1$

     $\}$

3.3.2. AA $\Rightarrow$ GIC

AA
$A = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, \varnothing)$

GIC
$G = (N, \Sigma, P, S)$
$N = \{S\} \cup \{[p, Z, q] / p, q \in Q, Z \in \Gamma\}$
P :

$\quad S \rightarrow [q_0, Z_0, q]$ $\qquad\qquad\qquad\qquad\qquad$ $\forall q \in Q$
$\quad [q, Z, q_{m+1}] \rightarrow a [q_1, X_1, q_2] [q_2, X_2, q_3] ... [q_m, X_m, q_{m+1}]$ $\quad$ $\forall q, q_1, q_2, \ldots, q_{m+1} \in Q$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad$ $\forall Z, X_1, X_2, \ldots, X_m \in \Gamma$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad$ $\forall a \in (\Sigma \cup \{\varepsilon\})$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad$ $(q_1, X_1 X_2 ... X_m) \in \delta(q, a, Z)$

Ejemplo:
$A = (\{q\}, \{i, e\}, \{Z\}, \delta, q, Z, \varnothing)$

$\delta(q, i, Z) = \{(q, ZZ)\}$
$\delta(q, e, Z) = \{(q, \varepsilon)\}$

Ejercicio:
$A = (\{q_0, q_1\}, \{0, 1\}, \{X, Z_0\}, \delta, q_0, Z_0, \varnothing)$

$\delta(q_0, 0, Z_0) = \{(q_0, XZ_0)\}$
$\delta(q_0, 0, X) = \{(q_0, XX)\}$
$\delta(q_0, 1, X) = \{(q_1, \varepsilon)\}$
$\delta(q_1, 1, X) = \{(q_1, \varepsilon)\}$
$\delta(q_1, \varepsilon, X) = \{(q_1, \varepsilon)\}$
$\delta(q_1, \varepsilon, Z_0) = \{(q_1, \varepsilon)\}$

Tarea:
$A = (\{q_0, q_1, q_2\}, \{a, b\}, \{A, B, Z_0\}, \delta, q_0, Z_0, \varnothing)$

$\delta(q_0, a, Z_0) = \{(q_1, AZ_0)\}$
$\delta(q_0, b, Z_0) = \{(q_1, BZ_0)\}$
$\delta(q_0, \varepsilon, Z_0) = \{(q_2, \varepsilon)\}$
$\delta(q_1, a, A) = \{(q_1, AA)\}$
$\delta(q_1, b, B) = \{(q_1, BB)\}$
$\delta(q_1, a, B) = \{(q_1, \varepsilon)\}$
$\delta(q_1, b, A) = \{(q_1, \varepsilon)\}$
$\delta(q_1, \varepsilon, Z_0) = \{(q_0, Z_0)\}$