S ::= W ; Z — FIRST(S) = FIRST(W) = {0,1,2,3,4,5,6,7,8,9,(}

Z ::= W ; Z | ε — FIRST(Z) = FIRST(W) ∪ {ε} = {0,1,2,3,4,5,6,7,8,9,(,ε}

W ::= P | POW — FIRST(W) = FIRST(P) = {0,1,2,3,4,5,6,7,8,9,(}

P ::= R | (W) — FIRST(P) = FIRST(R) ∪ {(} = {0,1,2,3,4,5,6,7,8,9,(}

R ::= L | L.L — FIRST(R) = FIRST(L) = {0,1,2,3,4,5,6,7,8,9}

L ::= C | CL — FIRST(L) = FIRST(C) = {0,1,2,3,4,5,6,7,8,9}

C ::= 0|1|2|3|4|5|6|7|8|9 — FIRST(C) = {0,1,2,3,4,5,6,7,8,9}

O ::= *|:|+|-|^ — FIRST(O) = {*,:,+,-,^}

FOLLOW(S) = ∅

FOLLOW(Z) = FOLLOW(S) = ∅

FOLLOW(W) = {;,)}

FOLLOW(P) = FOLLOW(W) ∪ FIRST(O) = {;,),*,:,+,-,^}

FOLLOW(R) = FOLLOW(P) = {;,),*,:,+,-,^}

FOLLOW(L) = FOLLOW(R) ∪ {.} = {;,),*,:,+,-,^,.}

FOLLOW(C) = FOLLOW(L) ∪ FIRST(L) = {;,),*,:,+,-,^,.,0,1,2,3,4,5,6,7,8,9}

FOLLOW(O) = FIRST(W) = {0,1,2,3,4,5,6,7,8,9,(}

Sprawdzenie 1 reguły

S: Brak alternatywy - reguła spełniona

Z: FIRST(W) ∩ {ε} = {0,1,2,3,4,5,6,7,8,9,(} ∩ {ε} = ∅ - reg. spełniona

W: FIRST(P) ∩ FIRST(P) = FIRST(P) ≠ ∅ - reg. niespełniona

P: FIRST(R) ∩ {(} = ∅ - reg. spełniona

R: FIRST(L) ∩ FIRST(L) = FIRST(L) ≠ ∅ - reg. niespełniona

L: FIRST(C) ∩ FIRST(C) = FIRST(C) ≠ ∅ - reg. niespełniona

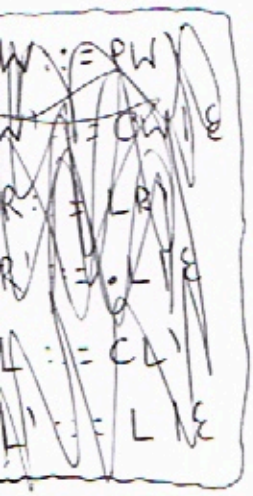
C: {0} ∩ {1} = ∅ ..... = ∅ - reg. spełniona

O: {*} ∩ {:} = ∅ ..... = ∅ - reg. spełniona

Sprawdzenie II reguły (dla produkcji z ε ten. dla Z)

$FIRST(Z) \cap FOLLOW(Z) = \{0,1,2,3,4,5,6,7,8,9,(,\varepsilon\} \cap \phi = \phi$ - reg. spełniona

Produkcje W, R, L wymagają poprawienia.



$S ::= W;Z$

$Z ::= W;Z \mid \varepsilon$

$W ::= PW'$

$W' ::= OW \mid \varepsilon$

$P ::= R \mid (W)$

$R ::= LR'$

$R' ::= .L \mid \varepsilon$

$L ::= CL'$

$L' ::= L \mid \varepsilon$

$C ::= 0|1|2|3|4|5|6|7|8|9$ $FIRST(C) = \{0,1,2,3,4,5,6,7,8,9\}$

$O ::= *|:|+|-|\wedge$ $FIRST(O) = \{*,:,+,-,\wedge\}$

Sprawdzamy I reguły dla poprawionych gramatyki:

W: Brak alternatywy - reg. spełniona

W': $FIRST(O) \cap \{\varepsilon\} = \{*,:,+,-,\wedge\} \cap \{\varepsilon\} = \phi$ - reg. spełniona

R: Brak alternatywy - reg. spełniona

R': $\{.\} \cap \{\varepsilon\} = \phi$ - reg. spełniona

L: Brak alternatywy - reg. spełniona

L': $FIRST(L) \cap \{\varepsilon\} = \phi$ - reg. spełniona

Sprawdzamy II reguły dla poprawionych produkcji z ε: (W', R', L')

W': $FIRST(W') = FIRST(O) \cup \{\varepsilon\} = \{*,:,+,-,\wedge,\varepsilon\}$

$FOLLOW(W') = FOLLOW(W) = \{;\} \cup FOLLOW(W') \cup \{)\} = \{;,)\}$

$FIRST(W') \cap FOLLOW(W') = \phi$ - reg. spełniona

R': $FIRST(R') = \{.,\varepsilon\}$

$FOLLOW(R') = FOLLOW(R) = FOLLOW(P) = FIRST(W') \cup FOLLOW(W) = \{*,:,+,-,\wedge,;,)\}$

$FIRST(R') \cap FOLLOW(R') = \phi$ - reg. spełniona

L': FIRST(L') = FIRST(L) ∪ {ε} = FIRST(C) ∪ {ε} = {0,1,2,3,4,5,6,7,8,9,ε}

FOLLOW(L') = FOLLOW(L) = FIRST(R') ∪ FOLLOW(R') ∪ FOLLOW(L) ∪ FOLLOW(L') =

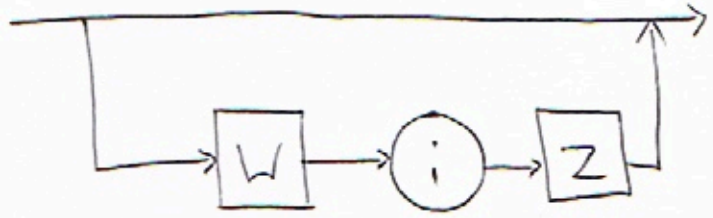
= {.,ε} ∪ {*,:,+,-,^,;,)} = {.,ε,*,:,+,-,^,;,)}

~~FIRST(L') ∩ FOLLOW(L') = {.} ≠ ∅ - reg. niespełniona~~

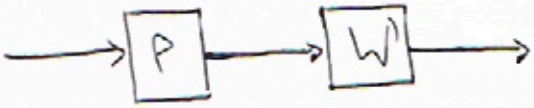
FIRST(L') = {0,1,2,3,4,5,6,7,8,9,ε} ∩ {.,ε,*,:,+,-,^,;,)} = ∅ - reg. spełniona

S ::= W ; Z

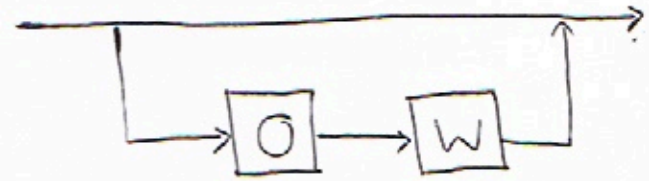
Z ::= W ; Z | ε



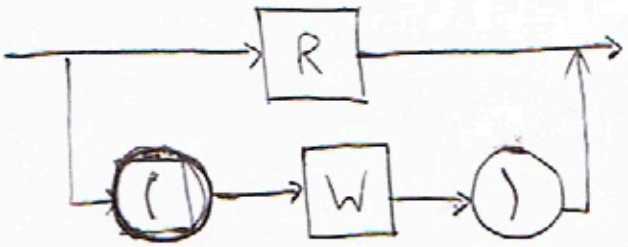
W ::= P W'



W' ::= O W | ε

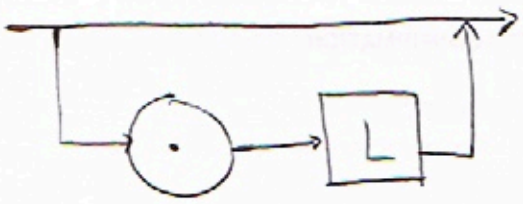


P ::= R | (W)

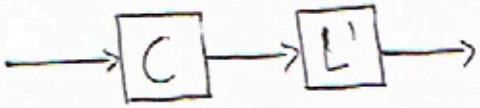


R ::= L R'

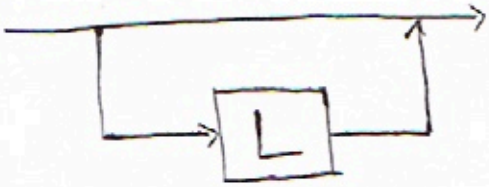
R' ::= .L | ε



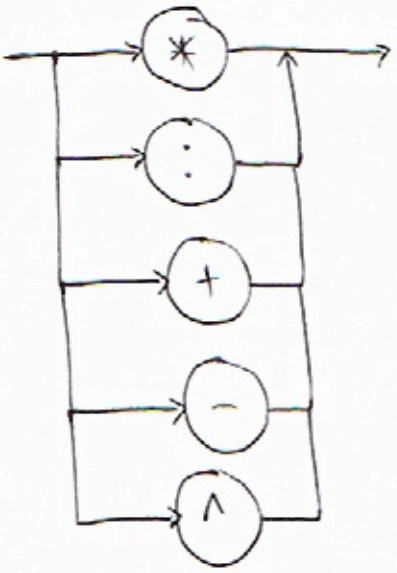
L ::= CL'



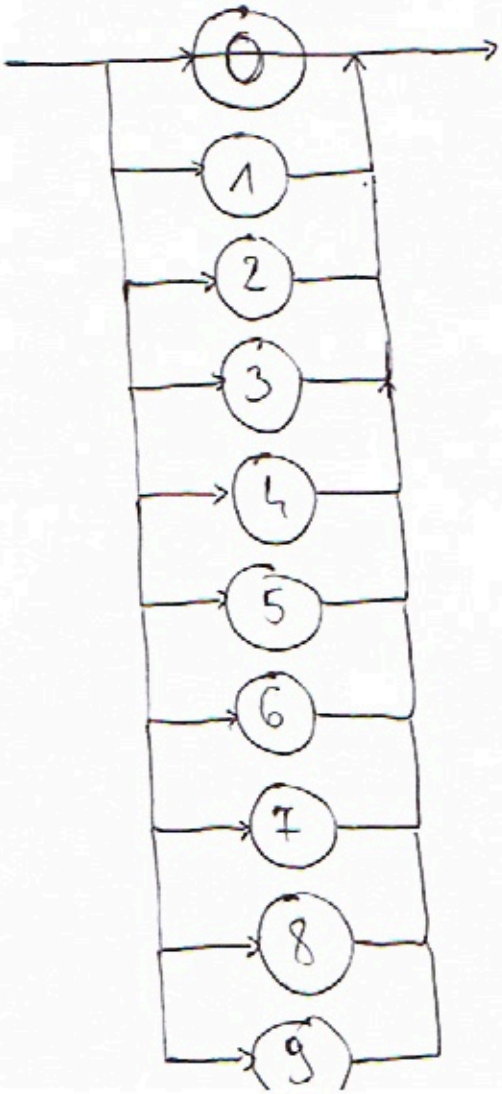
L' ::= L | ε



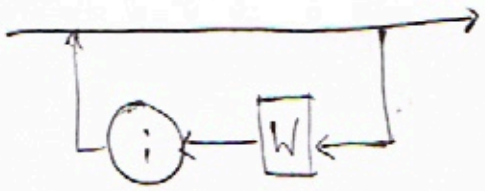
O ::= * | : | + | - | ^



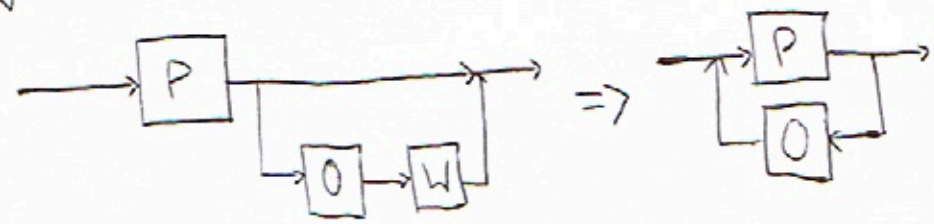
C ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9



Z

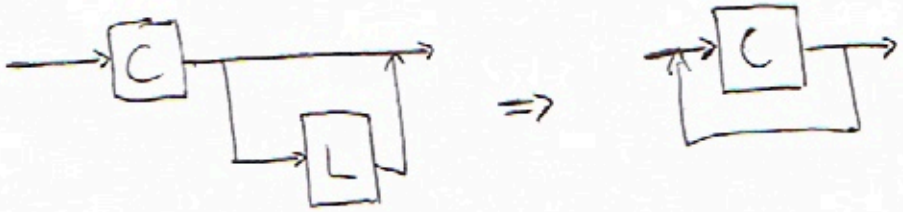


W

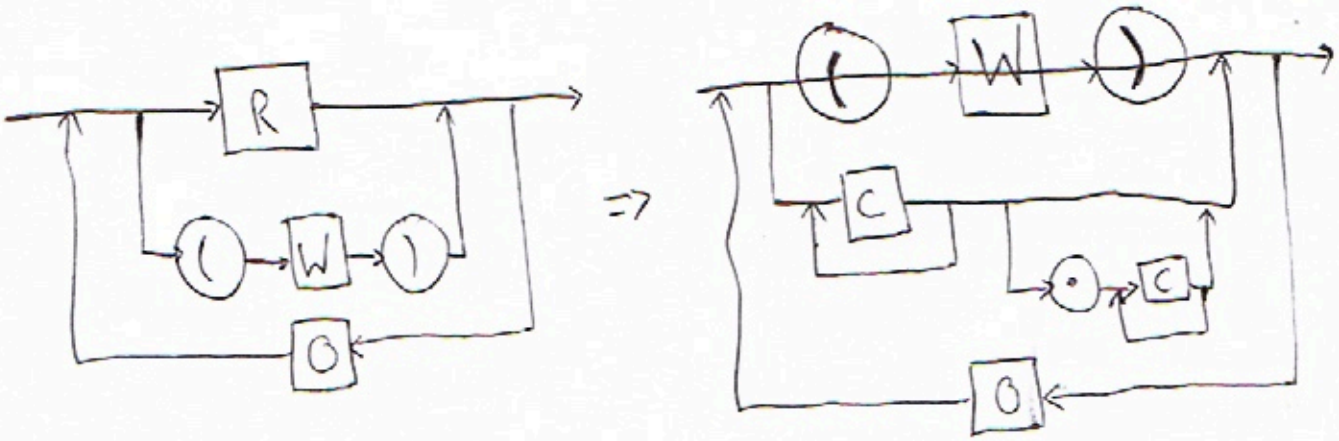


R

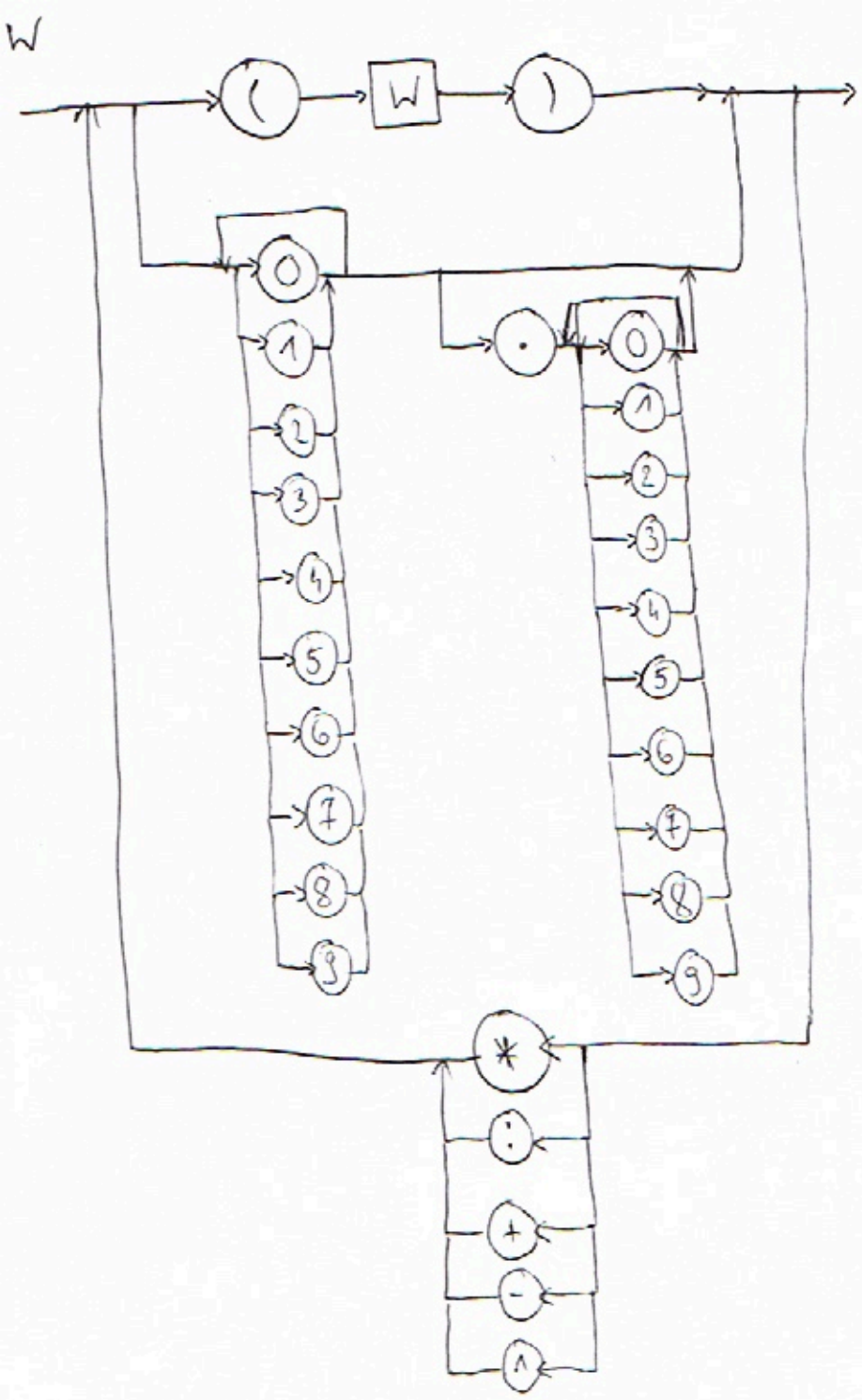
L



W



W



S