Lista FNC

a) $S \to AB \mid SCB$
$A \to aA \mid C$
$B \to bB \mid b$
$C \to cC \mid \lambda$

$\to V_\lambda\{A, C\} \to$

$S \to AB \mid B \mid SB \mid SCB$
$A \to aA \mid a \mid C$
$B \to bB \mid b$
$C \to cC \mid c$

unitárias

$\to$

$S \to AB \mid bB \mid b \mid SB \mid SCB$
$A \to aA \mid a \mid cC \mid c$
$B \to bB \mid b$
$C \to cC \mid c$

↓ Terminal em vars

$S \to AB \mid YB \mid b \mid SB \mid SCB$
$A \to XA \mid a \mid ZC \mid c$
$B \to YB \mid b$
$C \to ZC \mid c \quad X \to a \; Y \to b \; Z \to c$

Tam = 2 ←

$V = \{AB, C, X, Y, Z, K\}$; $P = \{S \to AB \mid YB \mid b \mid SB \mid SK$
$A \to XA \mid a \mid ZC \mid c$
$B \to YB \mid b$
$C \to ZC \mid c$
$X \to a \; Y \to b \; Z \to c$
$K \to CB\}$
$T = \{a, b, c\}$;
$S = S$;

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b) $S \to aAd \mid A$
$A \to Bc \mid \lambda$
$B \to Ac \mid a$

$V_\lambda = \{S, A\} \to$

$S \to aAd \mid A \mid ad \mid \lambda$
$A \to Bc$
$B \to Ac \mid a \mid c$

unitárias

$S \to aAd \mid Bc \mid ad \mid \lambda$
$A \to Bc$
$B \to Ac \mid a \mid c$

Terminal em vars →

$S \to XAZ \mid BY \mid XZ \mid \lambda$
$A \to BY$
$B \to AY \mid a \mid c$
$X \to a \; Y \to c \; Z \to d$

↓ Tam = 2

$V = \{A, B, X, Y, Z, K\}$; $P = \{S \to XK \mid BY \mid XZ \mid \lambda$
$A \to BY$
$B \to AY \mid a \mid c$
$X \to a \; Y \to c \; Z \to d$
$K \to AZ\}$;
$T = \{a, c, d\}$;
$S = S$;

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c) ~~S~~ $\to A \mid B \mid ABS$
$A \to aA \mid b$
$B \to aBAb \mid a$

unit. →

$S \to aA \mid b \mid aBAb \mid a \mid ABS$
$A \to aA \mid b$
$B \to aBAb \mid a$

Terminal em vars →

$S \to XA \mid b \mid XBAY \mid a \mid ABS$
$A \to XA \mid b$
$B \to XBAY \mid a \quad X \to a \; Y \to b$

↓ Tam = 2

$V = \{S, A, B, X, Y, K, N, D\}$; $P = \{S \to XA \mid b \mid KN \mid a \mid DS$
$A \to XA \mid b$
$B \to KN \mid a \quad X \to a \; Y \to b$
$K \to XB \quad N \to AY \quad D \to AB\}$;
$T = \{a, b\}$;
$S = S$;

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d) $S \to AB \mid CSB$
$A \to aB \mid C$
$B \to bbB \mid b$

unit → inútil

$S \to AB \mid \cancel{SSB}$
$A \to aB$
$B \to bbB \mid b$

Terminal em vars →

$S \to AB$
$A \to XB$
$B \to YYB \mid b$
$X \to a \; Y \to b$

Tam = 2 →

$P = \{S \to AB$
$A \to XB$
$B \to ZB \mid b$
$X \to a \; Y \to b \; Z \to YY\}$;

$V = \{S, A, B, X, Y, Z\}$;
$T = \{a, b\}$; $S = S$;

e) $S \to A \mid ABa \mid AbA$
$A \to Aa \mid aa$
$B \to Bb \mid BC$
$C \to CB \mid CA \mid bB$

unit → $S \to Aa \mid aa \mid ABa \mid AbA$
$A \to Aa \mid aa$
~~$B \to Bb \mid BC$~~
~~$C \to CB \mid CA \mid bB$~~

inútil → $S \to Aa \mid aa \mid AbA$
$A \to Aa \mid aa$

Terminal em var.

$P = \{S \to AX \mid XX \mid AYA$, $V = \{S, A, X, Y\}$;
$A \to AX \mid XX$, $T = \{a, b\}$;
$X \to a$ $Y \to b\}$; $S = S$;

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f) $S \to AB \mid BCS$
$A \to aA \mid C$
$B \to bbB \mid b$
$C \to cC \mid \lambda$

$V_\lambda = \{A, C\}$ → $S \to AB \mid B \mid BCS \mid BS$
$A \to aA \mid a \mid C$
$B \to bbB \mid b$
$C \to cC \mid c$

unit → $S \to AB \mid bbB \mid b \mid BCS \mid BS$
$A \to aA \mid a \mid cC \mid c$
$B \to bbB \mid b$
$C \to cC \mid c$

Terminal em var.

$V = \{S, A, B, C, X, Y, Z, K, N\}$; $P = \{S \to AB \mid KB \mid b \mid NS \mid BS$
$T = \{a, b, c\}$;
$S = S$;
$A \to XA \mid a \mid ZC \mid c$
$B \to KB \mid b$
$C \to ZC \mid c$
$X \to a$ $Y \to b$ $Z \to c$
$K \to YY$ $N \to BC\}$;

tam=2 ← $S \to AB \mid YYB \mid b \mid BCS \mid BS$
$A \to XA \mid a \mid ZC \mid c$
$B \to YYB \mid b$
$C \to ZC \mid c$ $X \to a$ $Y \to b$ $Z \to c$

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g) $S \to aAd \mid A \mid B$
$A \to Bc \mid c$
$B \to Ac$

unit → $S \to aAd \mid Bc \mid c \mid Ac$
$A \to Bc \mid c$
$B \to Ac$

Terminal em var → $S \to XAZ \mid BY \mid c \mid AY$
$A \to BY \mid c$
$B \to AY$
$X \to a$ $Y \to c$
$Z \to d$

Tam = 2 → $P = \{S \to KZ \mid BY \mid c \mid AY$
$A \to BY \mid c$
$B \to AY$
$X \to a$ $Y \to c$ $Z \to d$
$K \to XA\}$;

$V = \{S, A, B, X, Y, Z, K\}$
$T = \{a, c, d\}$;
$S = S$;

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h) $S \to aAd \mid A \mid \lambda$
$A \to Bc \mid c$
$B \to Ac \mid SS$

$V_\lambda = \{S, B\}$ → $S \to aAd \mid A \mid \lambda$
$A \to Bc \mid c$
$B \to Ac \mid SS \mid S$

unit → $S \to aAd \mid Bc \mid c \mid \lambda$
$A \to Bc \mid c$
$B \to Ac \mid SS \mid aAd \mid Bc \mid c \mid \lambda$

Terminal em var →
$S \to XAZ \mid BY \mid c \mid \lambda$
$A \to BY \mid c$
$B \to AY \mid SS \mid XAZ \mid BY \mid c \mid \lambda$
$X \to a$ $Y \to c$ $Z \to d$

Tam=2 ← $V = \{S, A, B, X, Y, Z, K\}$; $P = \{S \to KZ \mid BY \mid c \mid \lambda$
$T = \{a, c, d\}$;
$S = S$;
$A \to BY \mid c$
$B \to AY \mid SS \mid KZ \mid BY \mid c \mid \lambda$
$X \to a$ $Y \to c$ $Z \to d$
$K \to XA\}$;

Cont... FNC

i) S → aAbBcC
A → aA | λ
B → bB | A
C → A | B | D
D → aD | Db | cEc
E → dEf | dfE | D
F → Ea | bF | λ

$V_\lambda = \{A, B, C, F\}$ →

S → aAbBcC | abBcC | aAbcC | aAbBc | abcC | abBc | aAbc | abc
A → aA | a
B → bB | b | A
C → A | B | D
D → aD | Db | cEc
E → dEf | dfE | D
F → Ea | bF | b

↓ unit

S → aAbBcC | abBcC | aAbcC | aAbBc | abcC | abBc | aAbc | abc
A → aA | a
B → bB | b | aA | a
C → aA | a | bB | b | ~~aD~~ | ~~Db~~ | ~~cEc~~
D → ~~aD~~ | Db | cEc
E → ~~dEf~~ | ~~dfE~~ | ~~aD~~ | Db | cEc
~~F → Ea | bF | b~~ — inacessível

loop inf

↓ unitários

S → aAbBcC | abBcC | aAbcC | aAbBc | abcC | abBc | aAbc | abc
A → aA | a
B → bB | b | aA | a
C → aA | a | bB | b

I J K M ↓ Terminais em vars

S → XAYBZC | XYBZC | XAYZC | XAYBZ | XYZC | XYBZ | XAYZ
A → XA | a
B → YB | b | XA | a
C → XA | a | YB | b

N I M

X → a Y → b Z → c

O P ↓ Tam = 2

S → IJK | MNC | LC | IJZ | MK | MN | IN | MZ
A → XA | a
B → YB | b | XA | a
C → XA | a | YB | b

Q O

X → a Y → b Z → c L → YZ
I → XA J → YB K → ZC M → XY N → BZ

↓ Tam = 2

V = {S, A, B, C, X, Y, Z, I, J, K, L, M, N, O, P, Q};

T = {a, b, c};

S = S;

P = {S → OK | PC | QC | RZ | MK | MN | IN | MZ
A → XA | a
B → YB | b | XA | a
C → XA | a | YB | b
X → a Y → b Z → c L → YZ
I → XA J → YB K → ZC M → XY N → BZ
O → IJ P → MN Q → IL};