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4.1 Give context-free grammars generating the following sets. [a, b]

The set of palindromes (strings that read the same forward as backward) over the alphabet {a,b}.

G=(N,E,S,P)

N={S}

E={a,b}

S-> simbolo inicial

P:{

S-> aSa,

S -> bSb,

S -> b,

S -> a,

S -> *lamda (caractér vacío)*

}

The set of all strings over alphabet {a,b} with exactly twice as many a´s as b´s.

G=(N,E,S,P)

N={S}

E={a,b}

S-> simbolo inicial

P={

S-> SaSbSaS,

S-> SaSaSbS,

S-> SbSaSaS,

S-> *lamda (caractér vacío)*

}

4.8 Let G be the grammar. [a, b, c]

S-> aB|bA

A-> a|aS|bAA

B-> b|bS|aBB

for the string aaabbabbba find a

a)leftmost derivation b) rightmost derivation c) parse tree

a)

S-> a[B] -> aa[B]B -> aaa[B]BB -> aaab[B]B -> aaabb[B] -> aaabba[B]B -> aaabbab[B] -> aaabbabb[S] -> aaabbabbb[A] -> aaabbabbba

b)

S -> a[B] -> aaB[B] -> aaBb[S] -> aaBbb[A] -> aa[B]bba -> aaaB[B]bba -> aaaBb[S]bba -> aaaBba[B]bba -> aaa[B]babbba -> aaabbabbb

c)