

P206.

Exercises for Section 4.2

Exercise 4.2.1: Consider the context-free grammar:

$$S \rightarrow S S + \mid S S * \mid a$$

and the string $aa+a^*$

- a) Give a leftmost derivation for the string.
- b) Give a rightmost derivation for the string.
- c) Give a parse tree for the string.
- d) Is the grammar ambiguous or unambiguous? Justify your answer .
- e) Describe the language generated by this grammar.

Exercise 4.2.2: Repeat Exercise 4.2.1 for each of the following grammars and strings:

- a) $S \rightarrow 0 S 1 \mid 0 1$ with string 000111
- c) $S \rightarrow S (S) S \mid \varepsilon$ with string $((()))$