1. Show that the following grammar is ambiguous:

\[ S \rightarrow AU \\
S \rightarrow VC \\
U \rightarrow BC \\
V \rightarrow AB \\
A \rightarrow a \\
A \rightarrow f \\
B \rightarrow b \\
C \rightarrow c \\
C \rightarrow g \]

where upper case letters are nonterminals, lower case letters are terminals, and \( S \) is the start symbol. Give an equivalent unambiguous grammar.

2. Draw a parse tree for the grammar of example 3.1.3 and the string \( id \ast (id + id) + id \).

3. Problem 3.3.1, parts (b) and (c), from the text, page 135. Note that there is a mistake in one edition of the text in this problem. Part (b) should say “Show that \( aba, aa, abb \notin L(M) \), but \( baa, bab, baaaa \in L(M) \).”