Tik-79.144 **Syksy 1998**
Logic in Computer Science: Foundations
Exercises 1
15. ja 17.9.1998

1. Formalize the following statements using propositional logic:

a) I can't finish my work unless you help me.

b) I either walk, ride a bicycle or sometimes drive a car to work.

c) Merja and Arto are coming to visit us.

d) Because you have been naughty you won't get dessert.

e) Even though the manual was long it was not long enough.

f) If somebody asks me — or even if anybody doesn't ask — he shouldn't buy a car or he must live far from his workplace and the benzine should become cheaper.

2. Prove that all propositional statements have an even number of parenthesis.

3. Remove unnecessary parenthesis so that the meaning of the proposition doesn't change.

a) $(A \rightarrow ((B \wedge C) \vee D))$

b) $(((A \rightarrow B) \wedge (B \rightarrow C)) \rightarrow (A \rightarrow C))$

c) $((A \wedge (B \vee C)) \vee (A \wedge (C \vee D)))$

d) $((\neg(A \wedge B)) \leftrightarrow ((B \rightarrow C) \wedge A))$

e) $(((\neg A) \wedge (\neg B)) \rightarrow \neg(A \vee B))$