Theory of Computation

Homework 2
Due: 2011/10/25

Problem 1. Given a Boolean expression

$$\phi = ((a \wedge b) \Rightarrow (c \vee (d \Rightarrow e))) \wedge (a \Rightarrow f)\,.$$

(a) Turn ϕ into a CNF.

(b) Illustrate a Boolean circuit for CNF.

Problem 2. If $f(n)$ and $g(n)$ are proper complexity functions, sketch proofs that show the following items are proper complexity functions:

(a) $f(g)$,

(b) $f + g$,

(c) $f \cdot g$,

(d) 2^g.