Theory of Computation

Homework 2
Due: 2012/10/23

Problem 1. Let

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

(a) Turn ϕ into a CNF.

(b) Draw a Boolean circuit for your CNF of ϕ.

Problem 2. We know that the halting problem

$$H = \{M; x : M(x) \neq \nearrow\}$$

is undecidable. Use this fact to prove that the following language is undecidable:

$$L = \{M : M \text{ is a TM that accepts some input}\}.$$