

**Logic 1, WS 2016. Homework 2, given Oct 20, due Oct 27**

1. Write the boolean functions corresponding to negation, disjunction, implication, and equivalence.
2. Show by truth table that  $(P \wedge Q) \Rightarrow R \equiv (P \Rightarrow R) \vee (Q \Rightarrow R)$ .
3. Prove that for any propositional formulae  $\varphi_1, \varphi_2, \dots, \varphi_n, \psi$ , if  $(\varphi_1 \wedge \varphi_2 \wedge \dots \wedge \varphi_n) \Rightarrow \psi$  is valid, then  $\varphi_1, \varphi_2, \dots, \varphi_n \models \psi$ .  
(See the style used in the lecture for proving the opposite implication.)