

Harvey Mudd College
Computer Science 80
Logic for Computer Science
Spring Semester 2001

Assignment #3 – Propositional Logic: Natural Deduction
Due 11:00am, Wednesday February 21, 2001

Give Natural Deduction proofs of each of the following formulas. That is, give a Natural Deduction proof tree with the given formula as its conclusion, and no undischarged assumptions. (Note, brackets are used in place of parentheses in some formulas to make the structure clearer):

1. $[(p \wedge q) \Rightarrow r] \equiv [p \Rightarrow (q \Rightarrow r)]$
2. $(p \Rightarrow q) \Rightarrow [(r \Rightarrow p) \Rightarrow (r \Rightarrow q)]$
3. $([(p \Rightarrow q) \Rightarrow p] \Rightarrow p)$
4. $(p \Rightarrow r) \equiv \neg(p \wedge \neg r)$
5. $(p \Rightarrow r) \equiv (\neg p \vee r)$