MSc in Computer Science
at University of Milan

Formal Methods
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1 Natural Deduction

Theorem 1. $\forall\ P, Q \in \mathbb{N}$ *it holds that* $(P \to Q) \to (\neg Q \to \neg P)$.

Proof.

1. P, Q Premise

2. $P \to Q$ Premise

3. $\neg Q \to \neg P$ Goal

    (a) $\neg Q$ Assumption

    (b) P Assumption by contradiction

    (c) Q Modus ponens on 2 and (b)

    (d) $\bot$ Contradiction on 3 and (a)

    (e) $\neg P$ Negation introduction on 2 and (d)

$\square$