Theorema 2.0: A First Tour

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We consider “proving”, “computing”, and “solving” as the three basic mathematical activities.

1 Proving

We want to prove

$(\underset{x}{\forall}(P[x] \vee Q[x])) \wedge (\underset{y}{\forall}(P[y] \Rightarrow Q[y])) \Leftrightarrow (\underset{x}{\forall} Q[x])$.

To prove a formula like the above, we need to enter it in the context of a Theorema environment.
Proposition : First Test, 2014
$((\forall x\ (P[x] \vee Q[x]) \wedge \forall y\ (P[y] \to Q[y])) \iff \forall x\, Q[x])$

2 Computing

Definition : Lexical Ordering

$$\forall ab\ (LessTM_{lex}\,(a)\,b : \iff \exists\ (a_i < b_i \wedge \forall\, a_j = b_j))$$

Definition : Monomials

$$\forall Km2\ \left(Mon[K]_{TimesTM}\,(m1, m2) := \left(K_{TimesTM}\,(m1_1, m2_1)\,,_{[,\,PlusTM](m1_{2i}, m2_{2i})}\,\right)\right)$$

3 Set Theory

Definition : SUBSET

$\forall xy\ (x \subseteq y := \forall z\ (zx \to zy))$

Proposition : TRANSITIVITY OF

$\forall ac\ ((a \subseteq b \wedge b \subseteq c) \to a \subseteq c)$