Theorema 2.0: A First Tour

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
$((\forall x\ (P[x] \vee Q[x]) \wedge \forall y\ (P[y] \rightarrow Q[y])) \iff \forall x\, Q[x])$

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

3 Set Theory

Definition : subset
$\forall xy\ (x \subseteq y := \forall z\ (zx \rightarrow zy))$
Proposition : transitivity of
$\forall ac\ ((a \subseteq b \wedge b \subseteq c) \rightarrow a \subseteq c)$