Theorema 2.0: A First Tour

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

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1 Proving

We want to prove

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

To prove a formula like the above, we need to enter it in the context of a Theorema environment.

◆ **Proposition :** First Test, 2014

$$((\forall x \ (P[x] \lor Q[x]) \land \forall y \ (P[y] \to Q[y])) \iff \forall x \, Q[x])$$

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2 Computing

◆ **Definition :** Lexical Ordering

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

◆◆◆◆◆◆◆◆◆◆◆ **Definition :** Monomials

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

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3 Set Theory

◆ **Definition :** subset

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

◆◆ **Proposition :** transitivity of

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

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