Theorema 2.0: A First Tour

Tma2tex-parsing Info/Legend

- Yellow: Represents entry points to parsing.
- Orange: Helper Definitions were defined in the Theorema Notebook interface, but are directly included in the following formula.
- Red: Matches unspecified cells or generic content.
- Blue: Represents lists of specific content.
- Purple: Used for lists of generic cells.
- Green: Represents a CellGroup-Data Element with a List inside, a relevant content structure typically.

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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

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

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

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◆ 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

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• Definition: Lexical Ordering
• \forall ab \; (LessTM_{lex} (a) \; b : \iff \exists \; (a_i < b_i \land \forall \; a_j = b_j))
• Definition: Monomials
• \forall Km2 \; (Mon[K]_{TimesTM} \; (m1, m2) := (K_{TimesTM} \; (m1_1, m2_1) ,_{[,PlusTM](m1_{2i}, m2_{2i})}))
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3 Set Theory

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◆ 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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