Theorema 2.0: A First Tour

NB reached List of cells reached CellGroupData reached List of cells reached NullCell reached

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

CellGroupData reached List of cells reached

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.

1.1 Proposition (First Test, 2014)

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

Cell reached CellGroupData reached List of cells reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached Cell reached CellGroupData reached List of cells reached

2 Computing

2.1 Definition (Lexical Ordering)

2.1.1 Global Declaration

$\underset{\substack{a,b \\ a=b}}{\forall}$

a$<_{lex} b \rightarrow \left(\underset{i=1,...,a}{\exists} \left(a_i < b_i \wedge \left(\underset{j=1,...,i-1}{\forall} (a_j = b_j) \right) \right) \right)$ ■

Cell reached Cell reached CellGroupData reached List of cells reached Cell reached

2.2 Definition (Monomials)

2.2.1 Global Declaration

$\underset{K}{\forall}$

2.2.2 Global Declaration

Mon[K]:=$\underset{M}{\Delta}$

2.2.3 Global Declaration

$\underset{m1,m2}{\forall}$

m1 $\underset{M}{*} m2$:= $<m1_1 \underset{K}{*} m2_1, <(m1_2)_i + (m2_2)_i \underset{i=1,...,m1_2}{|} >>(m1 \underset{M}{<} m2)$ $Pattern not found! TagBox[RowBox[:, ,], Identity, SyntaxForm-> ab]$ $(m1_2$

Cell reached Cell reached Cell reached CellGroupData reached List of cells reached

3 Set Theory

3.1 Definition (subset)

3.1.1 Global Declaration

$\underset{x,y}{\forall}$

x:=$\left(\underset{z}{\forall}(z \Rightarrow z)\right)$ ■

Cell reached

3.2 Proposition (transitivity of $\subseteq$)

$\underset{a,b,c}{\forall}((a \wedge b) \Rightarrow a)$ ■

Cell reached CellGroupData reached List of cells reached Cell reached Cell reached CellGroupData reached List of cells reached Cell reached Cell reached