

## 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

$$(\forall_x (P[x] \vee Q[x])) \wedge (\forall_y (P[y] \Rightarrow Q[y])) \Leftrightarrow (\forall_x Q[x]).$$

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)

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

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 CellGroupData reached List of  
cells reached

### 2 Computing

CellGroupData reached List of cells reached Cell reached

### 2.0.1 Global Declaration

$\forall$   
 $a, b$   
 $a = b$

## 2.1 [?]

$\forall ab \text{ def } (LessTM$   
 $(a) b \iff \exists (ai < bi \wedge \forall aj = bj)$

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

### 2.1.1 Global Declaration

$\forall$   
 $K$

### 2.1.2 Global Declaration

$Mon[K] := \Delta_M$

### 2.1.3 Global Declaration

$\forall$   
 $m1, m2$

## 2.2 [?]

$\forall Km2 \text{ def } (Mon[K]_{TimesTM} (m1, m2) = (K_{TimesTM} (m11, m21), [PlusTM]_{(m12i, m22i)}))$

## 2.3 [?]

$\forall Km2 \text{ def } (Mon[K]_{LessTM} (m1, m2) \iff LessTM$   
 $(m12) m22$

■Cell reached CellGroupData reached List of cells reached Cell reached Cell reached CellGroupData reached List of cells reached Cell reached Cell reached CellGroupData reached List of cells reached Cell reached Cell reached Cell-

GroupData reached List of cells reached Cell reached Cell reached CellGroup-  
Data reached List of cells reached

### 3 Set Theory

CellGroupData reached List of cells reached Cell reached

#### 3.0.1 Global Declaration

$\forall$   
 $x,y$

#### 3.1 [?]

$\forall xy \text{ def } (x \subseteq y = \forall z (zx \rightarrow zy))$

■Cell reached

#### 3.2 Proposition (transitivity of $\subseteq$ )

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

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