

# 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)

Iff And Forall RNGSIMPRNG VARTheorema‘Knowledge‘VARxTMOrPVARTheorema‘Knowledge‘VAR  
Q VARTheorema‘Knowledge‘VARxTMForallRNG  
SIMPRNGVARTheorema‘Knowledge‘VARyTM Implies P  
VARTheorema‘Knowledge‘VARyTMQVARTheorema‘Knowledge‘VARyTM  
Forall RNGSIMPRNG VARTheorema‘Knowledge‘VARxTMQVARTheorema‘Knowledge‘VARxTM

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 RNGunexpectednumberofargumentsIffDefTma2tex'Private'tmaToInputOperator[Theorema'La  
 STEPRNGunexpectednumberofargumentsAndLessSubscriptVARTheorema'Knowledge'VARaTM  
 VARTheorema'Knowledge'VARiTMSubscriptVARTheorema'Knowledge'VARbTM  
 VARTheorema'Knowledge'VARiTMForallRNG  
 STEPRNGunexpectednumberofargumentsEqualSubscriptVARTheorema'Knowledge'VARaTM  
 VARTheorema'Knowledge'VARjTMSubscriptVARTheorema'Knowledge'VARbTM  
 VARTheorema'Knowledge'VARjTM

■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 CellGroup-  
 Data reached List of cells reached Cell reached

#### 2.1.1 Global Declaration

$$\forall_K$$

#### 2.1.2 Global Declaration

$$\text{Mon}[K] := \Delta_M$$

#### 2.1.3 Global Declaration

$$\forall_{m1,m2}$$

## 2.2 [?]

EqualDef Tma2tex‘Private‘tmaToInputOperator[Theorema‘Language‘DomainOperationTM[Theorema‘Knowledge‘Language‘TimesTM]]unexpectednumberofargumentsTupleTma2tex‘Private‘tmaToInputOperator[Theorema‘Language‘DomainOperationTM[Theorema‘Language‘PlusTM]]unexpectednumberofarguments

## 2.3 [?]

IffDef Tma2tex‘Private‘tmaToInputOperator[Theorema‘Language‘DomainOperationTM[Theorema‘Knowledge‘Language‘LessTM]]unexpectednumberofargumentsTma2tex‘Private‘tmaToInputOperator[Theorema‘Language‘LessTM]]unexpectednumberofarguments

■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 CellGroupData 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 RNGunexpectednumberofargumentsEqualDefSubsetEqualVARTheorema‘Knowledge‘VARxTMVARTheorema‘Knowledge‘VARyTMForallRNGSIMPRNGVARTheorema‘Knowledge‘VARzTMImpliesElementVARTheorema‘Knowledge‘VARzTMVARTheorema‘Knowledge‘VARxTMElementVARTheorema‘Knowledge‘VARzTMVARTheorema‘Knowledge‘VARyTM

■Cell reached

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

For all  $RNG$  *unexpected number of arguments implies and subset equal*  $VARTheorema'Knowledge'VARaTM$   
 $VARTheorema'Knowledge'VARbTM \subseteq VARTheorema'Knowledge'VARbTM$   
 $VARTheorema'Knowledge'VARcTM \subseteq VARTheorema'Knowledge'VARaTM$   
 $VARTheorema'Knowledge'VARcTM$

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