composite[COMPOSE,cross[composite[INVERSE,PLUS],PLUS]]

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<< goedel52.q68; << tools.m
:Package Title: goedel52.q68 2002 December 17 at 8:35 a.m

It is now: 2002 Dec 18 at 13:12

Loading Simplification Rules

TOOLS.M Revised 2002 November 30

weightlimit = 40

■ summary

In this notebook a formula for the natural map for the equivalence relation EQUIDIFF is derived, relating it to the function PLUS that takes each natural number to the corresponding non-negative integer.

■ derivation

To speed up the derivation, the simplify flag is turned off.

simplify = False;

The TriNormality test applied to the natural map yields a complicated mess. Turning it around yields a simplification rule:

\[
\text{composite[VERTSECT[EQUIDIFF], id[cart[omega, omega]]] \rightarrow TriNormality \rightarrow Reverse}
\]

This rule is put in place as a temporary rewrite rule.
The formula we want is now obtained by using \texttt{VSTriNormality}.

\begin{verbatim}
composite[  
  intersection[complement[fix[composite[complement[fix[composite[inverse[FIRST],  
    inverse[FIRST], rotate[NATADD], intersection[composite[inverse[FIRST],  
    rotate[inverse[power[SUCC]]], cross[SECOND, composite[FIRST, FIRST]]],  
    composite[inverse[SECOND], SECOND, FIRST, SECOND]]], inverse[E], SECOND]]],  
  complement[fix[composite[fix[composite[inverse[FIRST], inverse[FIRST], rotate[  
    NATADD], intersection[composite[inverse[FIRST], rotate[inverse[power[SUCC]]],  
    cross[SECOND, composite[FIRST, FIRST]]], composite[inverse[SECOND],  
    SECOND, FIRST, SECOND]]], complement[inverse[E], SECOND]]]
  id[cart[omega, omega]] := composite[VERTSECT[EQUIDIFF],  
  id[  
    cart[omega, omega]]]
\end{verbatim}

\texttt{composite[COMPOSE, cross[composite[INVERSE, PLUS], PLUS]] // VSTriNormality}

\texttt{composite[COMPOSE, cross[composite[INVERSE, PLUS], PLUS]] ==  
  composite[VERTSECT[EQUIDIFF], id[cart[omega, omega]]]}

\texttt{composite[COMPOSE, cross[composite[INVERSE, PLUS], PLUS]] :=  
  composite[VERTSECT[EQUIDIFF], id[cart[omega, omega]]]}