equations for ENUMS

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\texttt{In[1]}:= \texttt{SetDirectory["l:"]; \texttt{\textless \textless goedel.11sep12a}}

\texttt{:Package Title: goedel.11sep12a 2011 September 12 at 12:40 noon}

Loading takes about twelve minutes, half that time due to builtin pauses.

It is now: 2011 Sep 15 at 11:15

Loading Simplification Rules

TOOLS.M is now incorporated in the GOEDEL program as of 2010 September 3

weightlimit = 40

Loading completed.

It is now: 2011 Sep 15 at 11:27

\section*{summary}

Two equations for the class \texttt{ENUMS} of enumerators are derived.

\section*{derivation}

Theorem. A formula for the class \texttt{ENUMS}.

\texttt{In[2]}:= \texttt{SubstTest[class, x, member[x, y], y \rightarrow intersection[FUNS, \{P[cart[OMEGA, OMEGA], image[inverse[IMAGE[SWAP]], subcommutant[inverse[E]]]]\}]}}


\texttt{In[3]}:= \texttt{intersection[FUNS, \{image[inverse[IMAGE[SWAP]], subcommutant[inverse[E]]], P[cart[OMEGA, OMEGA]]\}] := ENUMS}

Another formula for \texttt{ENUMS} will be derived in which \texttt{subcommutant[inverse[E]]} is replaced with \texttt{monotone[E, E]}.

Theorem. A connection between \texttt{monotone[x, x]} and \texttt{subcommutant[x]}. 
Corollary. A special case of the above theorem needed here.

Lemma.

Theorem.

Lemma. An upper bound for ENUMS.

An inclusion in the opposite direction will now be derived.
Lemma.

\texttt{Out[28]= \texttt{subclass[U[intersection[monotone[E, E], U[image[MAP, cart[OMEGA, P[OMEGA]]]]], cart[OMEGA, OMEGA]] = True}} \texttt{}}

\texttt{In[29]= \% /. Equal -> SetDelayed} 

Lemma.

\texttt{Out[30]= \texttt{subclass[map[image[SWAP], intersection[monotone[E, E], U[image[MAP, cart[OMEGA, P[OMEGA]]]]], subcommutant[inverse[E]]]] = True}} 

Lemma. A lower bound for \texttt{ENUMS}.

\texttt{Out[32]= \texttt{subclass[intersection[monotone[E, E], U[image[MAP, cart[OMEGA, P[OMEGA]]]]], ENUMS] = True}} 

\texttt{In[33]= \% /. Equal -> SetDelayed} 

The two inclusions in opposite directions can be combined into an equation for \texttt{ENUMS}.

Theorem. Another formula for the class \texttt{ENUMS}.

\texttt{Out[34]= \texttt{equal[ENUMS, intersection[monotone[E, E], U[image[MAP, cart[OMEGA, P[OMEGA]]]]]] = True}} 

\texttt{In[35]= \texttt{intersection[monotone[E, E], U[image[MAP, cart[OMEGA, P[OMEGA]]]]] := ENUMS}}