

restrictions of complements of E, S to OMEGA

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```
<< goedel52.o19; << tools.m
:Package Title: goedel52.o19          2002 June 2 at 10:00 a.m.

It is now: 2002 Jun 2 at 12:10

Loading Simplification Rules

TOOLS.M          Revised 2002 May 22

weightlimit = 40
```

■ Temporary Abbreviation

```
r[x_] := restrict[x, OMEGA, OMEGA]
```

■ Complements of S and its inverse.

One rule is already known:

```
r[complement[inverse[S]]]
composite[id[OMEGA], E]
```

We can apply **DoubleInverse** to get a second rule:

```
r[complement[S]] // DoubleInverse
composite[id[OMEGA], complement[S], id[OMEGA]] == composite[inverse[E], id[OMEGA]]

composite[id[OMEGA], complement[S], id[OMEGA]] := composite[inverse[E], id[OMEGA]]
```

■ Complements of E and its inverse

The rule for **complement[E]** can be derived using **AssertTest**.

```
equal[composite[id[OMEGA], complement[E], id[OMEGA]],
      composite[id[OMEGA], inverse[S], id[OMEGA]]] // AssertTest

equal[composite[id[OMEGA], complement[E], id[OMEGA]],
      composite[id[OMEGA], inverse[S], id[OMEGA]]] == True

composite[id[OMEGA], complement[E], id[OMEGA]] :=
  composite[id[OMEGA], inverse[S], id[OMEGA]]
```

Again, there is an inverse rule:

```

composite[id[OMEGA], complement[inverse[E]], id[OMEGA]] // DoubleInverse

composite[id[OMEGA], complement[inverse[E]], id[OMEGA]] ==
  composite[id[OMEGA], S, id[OMEGA]]

composite[id[OMEGA], complement[inverse[E]], id[OMEGA]] :=
  composite[id[OMEGA], S, id[OMEGA]]

```

■ Summary

The upshot is that all restrictions of complements of **E**, **S** and their inverses can be eliminated:

```

Map[r, FourList[E]] // TableForm

composite[id[OMEGA], E]
composite[id[OMEGA], inverse[S], id[OMEGA]]
composite[id[OMEGA], S, id[OMEGA]]
composite[inverse[E], id[OMEGA]]

Map[r, FourList[S]] // TableForm

composite[id[OMEGA], S, id[OMEGA]]
composite[inverse[E], id[OMEGA]]
composite[id[OMEGA], E]
composite[id[OMEGA], inverse[S], id[OMEGA]]

```