two expressions of the form $f[w] \subset f[x] \cup f[y]$

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In[1]:= SetDirectory["l:"; << goedel.10jan01a; << tools.m

:Package Title: goedel.10jan01a 2010 January 1 at 5:45 p.m.

It is now: 2010 Jan 3 at 8:20

Loading Simplification Rules

TOOLS.M Revised 2009 December 17

weightlimit = 40

summary

Two curious rewrite rules are derived for expressions of the form $f[w] \subset f[x] \cup f[y]$. One is for the case that $f$ is the power class constructor, and the other is for the case that $f$ is the cartesian square constructor. The one rule implies the other.

derivation

Theorem. The case of cartesian squares.

In[2]:= SubstTest[subclass, image[E, u], image[E, v],
{u \rightarrow cartsq[w], v \rightarrow union[cartsq[x], cartsq[y]]}]

Out[2]= subclass[cart[w, w], union[cart[x, x], cart[y, y]]] == or[subclass[w, x], subclass[w, y]]

In[3]:= subclass[cart[w_, w_], union[cart[x_, x_], cart[y_, y_]]] :=
or[subclass[w, x], subclass[w, y]]

Corollary. The case of power classes.

In[4]:= SubstTest[subclass, P[w], cliques[u], u \rightarrow union[cartsq[x], cartsq[y]]] // Reverse

Out[4]= subclass[P[w], union[P[x], P[y]]] == or[subclass[w, x], subclass[w, y]]

In[5]:= subclass[P[w_], union[P[x_], P[y_]]] := or[subclass[w, x], subclass[w, y]]