

# l30\_rusub\_2 (TMTdDHTeELJC- qnRv2d5MY8Hsw3FyrQra7vM)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v5\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v6\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v7\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v8\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v2\_bhsp\_1 : \iota \Rightarrow o$  be given. Let  $l1\_bhsp\_1 : \iota \Rightarrow o$  be given. Let  $m1\_rusub\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_rusub\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_rusub\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_bhsp\_1 : \iota \Rightarrow o$  be given. Let  $k1\_rusub\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_tarSKI : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_realset1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_rlvect\_1 : \iota \Rightarrow \iota$  be given. Let  $k5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_numbers : \iota$  be given. Let  $u1\_bhsp\_1 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1. ((v1\_bhsp\_1 X1) \wedge ( \\ & m1\_rusub\_1 X1 X0) \Rightarrow ((k1\_rusub\_2 X0 (k1\_rusub\_1 X0) X1 = X1) \wedge (k1\_rusub\_2 \\ & X0 X1 (k1\_rusub\_1 X0) = X1))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1. (m1\_rusub\_1 X1 X0) \Rightarrow \\ & (\forall X2. ((v1\_bhsp\_1 X2) \wedge (m1\_rusub\_1 X2 X0) \Rightarrow ((m1\_rusub\_1 \\ & X1 X2) \Leftrightarrow (k1\_rusub\_2 X0 X1 X2 = X2)))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\ & (\forall X2.(m1\_rusub\_1 X2 X0) \Rightarrow ((m1\_rusub\_1 X1 (k1\_rusub\_2 X0 \\ & X1 X2)) \wedge (m1\_rusub\_1 X2 (k1\_rusub\_2 X0 X1 X2)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\ & (\forall X2.(m1\_rusub\_1 X2 X0) \Rightarrow (\forall X3.(m1\_rusub\_1 X3 X0) \Rightarrow \\ & (k1\_rusub\_2 X0 X1 (k1\_rusub\_2 X0 X2 X3) = k1\_rusub\_2 X0 (k1\_rusub\_2 \\ & X0 X1 X2) X3)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\ & (m1\_rusub\_1 (k1\_rusub\_1 X0) X1)) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0. \forall X1. (r1\_tarski X0 X1) \Rightarrow (k3\_xboole\_0 X0 X1 = X0) \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhsp\_1 \\ & X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\ & (\forall X2.(m1\_rusub\_1 X2 X0) \Rightarrow ((r1\_tarski (u1\_struct\_0 X1) ( \\ & u1\_struct\_0 X2)) \Rightarrow (m1\_rusub\_1 X1 X2)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\ & ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v1\_bhsp\_1 \\ & X0) \wedge ((v2\_bhsp\_1 X0) \wedge (l1\_bhsp\_1 X0)))))))))) \Rightarrow (\forall X1. \\ & ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\ & v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v5\_rlvect\_1 X1) \wedge ((v6\_rlvect\_1 \\ & X1) \wedge ((v7\_rlvect\_1 X1) \wedge ((v8\_rlvect\_1 X1) \wedge ((v1\_bhsp\_1 X1) \wedge (( \\ & v2\_bhsp\_1 X1) \wedge (l1\_bhsp\_1 X1)))))))))) \Rightarrow (((m1\_rusub\_1 X0 X1) \wedge \\ & (m1\_rusub\_1 X1 X0)) \Rightarrow (X0 = X1))) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((r1\_tarski\ X0\ X1)\wedge(r1\_tarski\ X1\ X2))\Rightarrow(r1\_tarski\ X0\ X2) \quad (9)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v5\_rlvect\_1\ X0)\wedge((v6\_rlvect\_1\ X0)\wedge((v7\_rlvect\_1\ X0)\wedge((v8\_rlvect\_1\ X0)\wedge((v2\_bhsp\_1\ X0)\wedge(l1\_bhsp\_1\ X0))))))))))\Rightarrow(m1\_rusub\_1\ X0\ X0) \quad (10)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v5\_rlvect\_1\ X0)\wedge((v6\_rlvect\_1\ X0)\wedge((v7\_rlvect\_1\ X0)\wedge((v8\_rlvect\_1\ X0)\wedge((v2\_bhsp\_1\ X0)\wedge(l1\_bhsp\_1\ X0))))))))))\Rightarrow(\forall X1.(m1\_rusub\_1\ X1\ X0)\Rightarrow(\forall X2.(m1\_rusub\_1\ X2\ X0)\Rightarrow((m1\_rusub\_1\ (k2\_rusub\_2\ X0\ X1\ X2)\ X1)\wedge(m1\_rusub\_1\ (k2\_rusub\_2\ X0\ X1\ X2)\ X2)))) \quad (11)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v5\_rlvect\_1\ X0)\wedge((v6\_rlvect\_1\ X0)\wedge((v7\_rlvect\_1\ X0)\wedge((v8\_rlvect\_1\ X0)\wedge((v2\_bhsp\_1\ X0)\wedge(l1\_bhsp\_1\ X0))))))))))\Rightarrow(\forall X1.(m1\_rusub\_1\ X1\ X0)\Rightarrow(\forall X2.((v1\_bhsp\_1\ X2)\wedge(m1\_rusub\_1\ X2\ X0))\Rightarrow((r1\_tarski\ (u1\_struct\_0\ X1)\ (u1\_struct\_0\ X2))\Rightarrow(k1\_rusub\_2\ X0\ X1\ X2 = X2)))) \quad (12)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v5\_rlvect\_1\ X0)\wedge((v6\_rlvect\_1\ X0)\wedge((v7\_rlvect\_1\ X0)\wedge((v8\_rlvect\_1\ X0)\wedge((v2\_bhsp\_1\ X0)\wedge(l1\_bhsp\_1\ X0))))))))))\Rightarrow(\forall X1.(m1\_rusub\_1\ X1\ X0)\Rightarrow(\forall X2.(m1\_rusub\_1\ X2\ X0)\Rightarrow(r1\_tarski\ (u1\_struct\_0\ X1)\ (u1\_struct\_0\ (k1\_rusub\_2\ X0\ X1\ X2)))) \quad (13)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v5\_rlvect\_1\ X0)\wedge((v6\_rlvect\_1\ X0)\wedge((v7\_rlvect\_1\ X0)\wedge((v8\_rlvect\_1\ X0)\wedge((v2\_bhsp\_1\ X0)\wedge(l1\_bhsp\_1\ X0))))))))))\Rightarrow(\forall X1.(m1\_rusub\_1\ X1\ X0)\Rightarrow(\forall X2.(m1\_rusub\_1\ X2\ X0)\Rightarrow(r1\_tarski\ (u1\_struct\_0\ (k2\_rusub\_2\ X0\ X1\ X2)\ (u1\_struct\_0\ X1)))) \quad (14)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhspl\_1 \\
& X0) \wedge (l1\_bhspl\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\
& v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v5\_rlvect\_1 X1) \wedge ((v6\_rlvect\_1 \\
& X1) \wedge ((v7\_rlvect\_1 X1) \wedge ((v8\_rlvect\_1 X1) \wedge ((v2\_bhspl\_1 X1) \wedge (l1\_bhspl\_1 \\
& X1))))))))))))) \\
\end{aligned} \tag{15}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge \\
& ((v5\_rlvect\_1 X0) \wedge ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 \\
& X0) \wedge ((v2\_bhspl\_1 X0) \wedge (l1\_bhspl\_1 X0)))))))))) \wedge ((m1\_rusub\_1 \\
& X1 X0) \wedge (m1\_rusub\_1 X2 X0))) \Rightarrow ((v1\_bhspl\_1 (k2\_rusub\_2 X0 X1 X2)) \wedge \\
& (m1\_rusub\_1 (k2\_rusub\_2 X0 X1 X2) X0)) \\
\end{aligned} \tag{16}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge \\
& ((v5\_rlvect\_1 X0) \wedge ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 \\
& X0) \wedge ((v2\_bhspl\_1 X0) \wedge (l1\_bhspl\_1 X0)))))))))) \wedge ((m1\_rusub\_1 \\
& X1 X0) \wedge (m1\_rusub\_1 X2 X0))) \Rightarrow ((v1\_bhspl\_1 (k1\_rusub\_2 X0 X1 X2)) \wedge \\
& (m1\_rusub\_1 (k1\_rusub\_2 X0 X1 X2) X0)) \\
\end{aligned} \tag{17}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhspl\_1 \\
& X0) \wedge (l1\_bhspl\_1 X0)))))))))) \Rightarrow ((v1\_bhspl\_1 (k1\_rusub\_1 X0)) \wedge \\
& (m1\_rusub\_1 (k1\_rusub\_1 X0) X0)) \\
\end{aligned} \tag{18}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhspl\_1 \\
& X0) \wedge (l1\_bhspl\_1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\
& (\forall X2.(m1\_rusub\_1 X2 X0) \Rightarrow (\forall X3.((v1\_bhspl\_1 X3) \wedge ( \\
& m1\_rusub\_1 X3 X0))) \Rightarrow ((X3 = k2\_rusub\_2 X0 X1 X2) \Leftrightarrow (u1\_struct\_0 X3 = \\
& k3\_xboole\_0 (u1\_struct\_0 X1) (u1\_struct\_0 X2)))))) \\
\end{aligned} \tag{19}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhspl1 \\
& X0) \wedge (l1\_bhspl1 X0)))))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge \\
& ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 \\
& X1) \wedge ((v5\_rlvect\_1 X1) \wedge ((v6\_rlvect\_1 X1) \wedge ((v7\_rlvect\_1 X1) \wedge \\
& ((v8\_rlvect\_1 X1) \wedge ((v2\_bhspl1 X1) \wedge (l1\_bhspl1 X1)))))))))) \Rightarrow \\
& ((m1\_rusub\_1 X1 X0) \Leftrightarrow ((r1\_tarski (u1\_struct\_0 X1) (u1\_struct\_0 \\
& X0)) \wedge ((k4\_struct\_0 X1 = k4\_struct\_0 X0) \wedge ((u1\_algstr\_0 X1 = k1\_realset1 \\
& (u1\_algstr\_0 X0) (u1\_struct\_0 X1)) \wedge ((u1\_rlvect\_1 X1 = k5\_relat\_1 \\
& (u1\_rlvect\_1 X0) (k2\_zfmisc\_1 k1\_numbers (u1\_struct\_0 X1))) \wedge \\
& (u1\_bhspl1 X1 = k1\_realset1 (u1\_bhspl1 X0) (u1\_struct\_0 X1)))))))))
\end{aligned} \tag{20}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v5\_rlvect\_1 X0) \wedge \\
& ((v6\_rlvect\_1 X0) \wedge ((v7\_rlvect\_1 X0) \wedge ((v8\_rlvect\_1 X0) \wedge ((v2\_bhspl1 \\
& X0) \wedge (l1\_bhspl1 X0)))))))))) \Rightarrow (\forall X1.(m1\_rusub\_1 X1 X0) \Rightarrow \\
& (\forall X2.(m1\_rusub\_1 X2 X0) \Rightarrow (u1\_struct\_0 (k1\_rusub\_2 X0 (k2\_rusub\_2 \\
& X0 X1 X2) X2) = u1\_struct\_0 X2)))
\end{aligned}$$