

t15\_midsp\_2 (TMN-  
fArsqAzFHtzBt9MwY9QH1TuaUJyQnzFg)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_midsp\_1 : \iota \Rightarrow o$  be given. Let  $l1\_midsp\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k15\_midsp\_1 : \iota \Rightarrow \iota$  be given. Let  $m1\_midsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_midsp\_1 : \iota \Rightarrow \iota$  be given. Let  $k3\_rlvect\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_midsp\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k14\_midsp\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k10\_midsp\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $k12\_midsp\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $l1\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $k1\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v8\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $l2\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $k11\_midsp\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow (k4\_struct\_0 (k15\_midsp\_1 X0) = k14\_midsp\_1 X0) \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow & (r1\_funct\_2 (k2\_zfmisc\_1 (u1\_struct\_0 (k15\_midsp\_1 X0)) \\ & (u1\_struct\_0 (k15\_midsp\_1 X0))) (u1\_struct\_0 (k15\_midsp\_1 X0)) \\ & (k2\_zfmisc\_1 (k10\_midsp\_1 X0) (k10\_midsp\_1 X0)) (k10\_midsp\_1 X0) \\ & (u1\_algstr\_0 (k15\_midsp\_1 X0)) (k12\_midsp\_1 X0)) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow (u1\_struct\_0 (k15\_midsp\_1 X0) = k10\_midsp\_1 X0) \quad (3)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow (\forall X1. (m1\_midsp\_1 X1 X0) \Leftrightarrow (X1 \in k10\_midsp\_1 X0)) \quad (4)$$

Assume the following.

$$\forall X0.\forall X1.(m1\_subset\_1 X0 X1)\Rightarrow((v1\_xboole\_0 X1)\vee (X0 \in X1)) \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge(l1\_algstr\_0 X0))\Rightarrow(\forall X1. \\ (m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 \\ (u1\_struct\_0 X0))\Rightarrow(k1\_algstr\_0 X0 X1 X2 = k5\_binop\_1 (u1\_struct\_0 \\ X0) (u1\_algstr\_0 X0) X1 X2))) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.(X0 \in X1)\Rightarrow(m1\_subset\_1 X0 X1) \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ ((\neg v1\_xboole\_0 X1)\wedge((\neg v1\_xboole\_0 X3)\wedge(((v1\_funct\_1 X4)\wedge( \\ v1\_funct\_2 X4 X0 X1)\wedge(m1\_subset\_1 X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ X0 X1))))))\wedge((v1\_funct\_1 X5)\wedge((v1\_funct\_2 X5 X2 X3)\wedge(m1\_subset\_1 \\ X5 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X2 X3))))))\Rightarrow((r1\_funct\_2 X0 X1 \\ X2 X3 X4 X5)\Leftrightarrow(X4 = X5)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((v2\_rlvect\_1 X0)\wedge(l1\_algstr\_0 \\ X0))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 \\ X0))))\Rightarrow(k3\_rlvect\_1 X0 X1 X2 = k1\_algstr\_0 X0 X1 X2) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_midsp\_1 X0)\wedge(l1\_midsp\_1 \\ X0)))\Rightarrow((\neg v2\_struct\_0 (k15\_midsp\_1 X0))\wedge(v8\_algstr\_0 (k15\_midsp\_1 \\ X0))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_midsp\_1 X0)\wedge(l1\_midsp\_1 \\ X0)))\Rightarrow(\neg v1\_xboole\_0 (k10\_midsp\_1 X0)) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_midsp\_1 X0)\wedge(l1\_midsp\_1 \\ X0)))\Rightarrow(((v13\_algstr\_0 (k15\_midsp\_1 X0))\wedge((v2\_rlvect\_1 (k15\_midsp\_1 \\ X0))\wedge((v3\_rlvect\_1 (k15\_midsp\_1 X0))\wedge(v4\_rlvect\_1 (k15\_midsp\_1 \\ X0)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_algstr\_0 X0) \Rightarrow & ((v1\_funct\_1 (u1\_algstr\_0 X0)) \wedge \\ & ((v1\_funct\_2 (u1\_algstr\_0 X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 (u1\_algstr\_0 \\ & X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0.(l2\_algstr\_0 X0) \Rightarrow ((l2\_struct\_0 X0) \wedge (l1\_algstr\_0 X0)) \quad (14)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 \\ X0) \wedge (l1\_midsp\_1 X0))) \wedge ((m1\_midsp\_1 X1 X0) \wedge (m1\_midsp\_1 X2 X0))) \Rightarrow \\ (m1\_midsp\_1 (k7\_midsp\_1 X0 X1 X2) X0) \end{aligned} \quad (15)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow (l2\_algstr\_0 (k15\_midsp\_1 X0)) \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 \\ X0))) \Rightarrow ((v1\_funct\_1 (k12\_midsp\_1 X0)) \wedge ((v1\_funct\_2 (k12\_midsp\_1 \\ X0) (k2\_zfmisc\_1 (k10\_midsp\_1 X0) (k10\_midsp\_1 X0)) (k10\_midsp\_1 \\ X0)) \wedge (m1\_subset\_1 (k12\_midsp\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ (k2\_zfmisc\_1 (k10\_midsp\_1 X0) (k10\_midsp\_1 X0)) (k10\_midsp\_1 \\ X0)))))) \end{aligned} \quad (17)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 X0))) \Rightarrow (k14\_midsp\_1 X0 = k6\_midsp\_1 X0) \quad (18)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 \\ X0))) \Rightarrow (\forall X1.((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 X1 (k2\_zfmisc\_1 \\ (k10\_midsp\_1 X0) (k10\_midsp\_1 X0)) (k10\_midsp\_1 X0)) \wedge (m1\_subset\_1 \\ X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (k10\_midsp\_1 X0) (k10\_midsp\_1 \\ X0)) (k10\_midsp\_1 X0)))))) \Rightarrow ((X1 = k12\_midsp\_1 X0) \Leftrightarrow (\forall X2. \\ (m1\_subset\_1 X2 (k10\_midsp\_1 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 \\ (k10\_midsp\_1 X0)) \Rightarrow (k5\_binop\_1 (k10\_midsp\_1 X0) X1 X2 X3 = k11\_midsp\_1 \\ X0 X2 X3)))))) \end{aligned} \quad (19)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 \\
& X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k10\_midsp\_1 X0)) \Rightarrow (\forall X2. \\
& (m1\_subset\_1 X2 (k10\_midsp\_1 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 \\
& (k10\_midsp\_1 X0)) \Rightarrow ((X3 = k11\_midsp\_1 X0 X1 X2) \Leftrightarrow (\forall X4.(m1\_midsp\_1 \\
& X4 X0) \Rightarrow (\forall X5.(m1\_midsp\_1 X5 X0) \Rightarrow (((X1 = X4) \wedge (X2 = X5)) \Rightarrow (X3 = \\
& k7\_midsp\_1 X0 X4 X5)))))))))
\end{aligned} \tag{20}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_midsp\_1 X0) \wedge (l1\_midsp\_1 \\
& X0))) \Rightarrow ((\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 (k15\_midsp\_1 \\
& X0))) \Leftrightarrow (m1\_midsp\_1 X1 X0)) \wedge ((k4\_struct\_0 (k15\_midsp\_1 X0) = k6\_midsp\_1 \\
& X0) \wedge (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 (k15\_midsp\_1 X0))) \Rightarrow \\
& (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 (k15\_midsp\_1 X0))) \Rightarrow \\
& (\forall X3.(m1\_midsp\_1 X3 X0) \Rightarrow (\forall X4.(m1\_midsp\_1 X4 X0) \Rightarrow \\
& (((X1 = X3) \wedge (X2 = X4)) \Rightarrow (k3\_rlvect\_1 (k15\_midsp\_1 X0) X1 X2 = k7\_midsp\_1 \\
& X0 X3 X4)))))))))
\end{aligned}$$