

# t1\_msinst\_1 (TMJaPXnsZn- SNxK8MGgXJWsnQK4f7FKnTZcn)

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Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v11\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v12\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $l2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $k1\_msinst\_1 : \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v2\_msalimit : \iota \Rightarrow o$  be given. Let  $m3\_msalimit : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_msalimit : \iota \Rightarrow \iota$  be given. Let  $v6\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $k1\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_altcat\_1 : \iota \Rightarrow \iota$  be given. Let  $k6\_msalimit : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k4\_tarSKI : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_altcat\_1 : \iota \Rightarrow \iota$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} \forall X0. ((\neg v1\_xboole\_0 X0) \wedge (v2\_msalimit X0)) \Rightarrow (\forall X1. \\ (m3\_msalimit X1 X0) \Leftrightarrow (m1\_subset\_1 X1 X0)) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v1\_xboole\_0 (k5\_msalimit X0)) \wedge (v2\_msalimit (k5\_msalimit X0))) \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow ((\neg v2\_struct\_0 (k1\_msinst\_1 X0)) \wedge \\ ((v2\_altcat\_1 (k1\_msinst\_1 X0)) \wedge ((v6\_altcat\_1 (k1\_msinst\_1 \\ X0)) \wedge ((v11\_altcat\_1 (k1\_msinst\_1 X0)) \wedge (v12\_altcat\_1 (k1\_msinst\_1 \\ X0)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0. ((\neg v1\_xboole\_0 X0) \wedge (v2\_msalimit X0)) \Rightarrow (\forall X1. \\ (m3\_msalimit X1 X0) \Rightarrow ((\neg v2\_struct\_0 X1) \wedge ((\neg v11\_struct\_0 X1) \wedge \\ ((v1\_msualg\_1 X1) \wedge (l1\_msualg\_1 X1)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned}
& \forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge \\
& ((v6\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1))) \Rightarrow ((X1 = k1\_msinst\_1 X0) \Leftrightarrow \\
& ((u1\_struct\_0 X1 = k5\_msalimit X0) \wedge ((\forall X2.(m3\_msalimit \\
& X2 (k5\_msalimit X0)) \Rightarrow (\forall X3.(m3\_msalimit X3 (k5\_msalimit \\
& X0)) \Rightarrow (k1\_binop\_1 (u1\_altcat\_1 X1) X2 X3 = k6\_msalimit X2 X3))) \wedge \\
& (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X1)) \Rightarrow (\forall X3.(m1\_subset\_1 \\
& X3 (u1\_struct\_0 X1)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 \\
& X1)) \Rightarrow (((X2 \in k5\_msalimit X0) \wedge (X3 \in k5\_msalimit X0) \wedge (X4 \in k5\_msalimit \\
& X0)) \Rightarrow (\forall X5.((v1\_relat\_1 X5) \wedge (v1\_funct\_1 X5)) \Rightarrow (\forall X6. \\
& ((v1\_relat\_1 X6) \wedge (v1\_funct\_1 X6)) \Rightarrow (\forall X7.((v1\_relat\_1 \\
& X7) \wedge (v1\_funct\_1 X7)) \Rightarrow (\forall X8.((v1\_relat\_1 X8) \wedge (v1\_funct\_1 \\
& X8)) \Rightarrow (((k4\_tarski X5 X6 \in k1\_binop\_1 (u1\_altcat\_1 X1) X2 X3) \wedge (k4\_tarski \\
& X7 X8 \in k1\_binop\_1 (u1\_altcat\_1 X1) X3 X4)) \Rightarrow (k1\_binop\_1 (k4\_altcat\_1 \\
& (u1\_struct\_0 X1) (u1\_altcat\_1 X1) (u2\_altcat\_1 X1) X2 X3 X4) (k4\_tarski \\
& X7 X8) (k4\_tarski X5 X6) = k4\_tarski (k3\_relat\_1 X5 X7) (k3\_relat\_1 \\
& X6 X8)))))))))))))
\end{aligned} \tag{5}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.(\neg v1\_xboole\_0 X0) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge \\
& ((v2\_altcat\_1 X1) \wedge (v11\_altcat\_1 X1) \wedge (v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 \\
& X1)))) \Rightarrow ((X1 = k1\_msinst\_1 X0) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\
& X1)) \Rightarrow ((\neg v2\_struct\_0 X2) \wedge ((\neg v11\_struct\_0 X2) \wedge (l1\_msualg\_1 X2))))))
\end{aligned}$$