

t21_msaterm (TMN- RgXGt4qdGgUYBUBF4PykGrCKhKGD81Tt)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v11_struct_0 : \iota \Rightarrow o$ be given. Let $l1_msualg_1 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v2_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $m1_trees_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_trees_3 : \iota \Rightarrow \iota$ be given. Let $k5_msafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_msaterm : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_msaterm : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_msaterm : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_lang1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_dtconstr : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_dtconstr : \iota \Rightarrow o$ be given. Let $v2_dtconstr : \iota \Rightarrow o$ be given. Let $v3_dtconstr : \iota \Rightarrow o$ be given. Let $v1_lang1 : \iota \Rightarrow o$ be given. Let $l1_lang1 : \iota \Rightarrow o$ be given. Let $m2_subset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k7_dtconstr : \iota \Rightarrow \iota$ be given. Let $k4_dtconstr : \iota \Rightarrow \iota$ be given. Let $m2_dtconstr : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_msualg_1 X0))) \wedge ((v1_relat_1 X1) \wedge ((v2_relat_1 X1) \wedge ((v4_relat_1 \\ & X1 (u1_struct_0 X0)) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 (u1_struct_0 \\ & X0)))))) \Rightarrow ((v1_dtconstr (k5_msafree X0 X1)) \wedge ((v2_dtconstr (\\ & k5_msafree X0 X1)) \wedge (v3_dtconstr (k5_msafree X0 X1)))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_msualg_1 X0))) \wedge ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 (u1_struct_0 \\ & X0)) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 (u1_struct_0 X0)))))) \Rightarrow \\ & ((\neg v2_struct_0 (k5_msafree X0 X1)) \wedge (v1_lang1 (k5_msafree X0 X1))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge \\ & (l1_msualg_1 X0))) \wedge ((v1_relat_1 X1) \wedge ((v4_relat_1 X1 (u1_struct_0 \\ & X0)) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 (u1_struct_0 X0)))))) \Rightarrow \\ & (l1_lang1 (k5_msafree X0 X1)) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 \\ & X0)\wedge(l1_msualg_1 X0)))\wedge(((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge \\ & ((v4_relat_1 X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 \\ & X1 (u1_struct_0 X0))))))\wedge(m1_subset_1 X2 (u4_struct_0 X0)))\Rightarrow \\ & (m2_subset_1 (k2_msaterm X0 X1 X2) (u1_struct_0 (k5_msafree X0 \\ & X1)) (k7_dtconstr (k5_msafree X0 X1))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((v2_dtconstr X0)\wedge((v3_dtconstr \\ & X0)\wedge(l1_lang1 X0))))\Rightarrow(\forall X1.(m2_subset_1 X1 (u1_struct_0 \\ & X0) (k7_dtconstr X0))\Rightarrow(\forall X2.(m1_trees_4 X2 (k5_trees_3 \\ & (u1_struct_0 X0)) (k4_dtconstr X0))\Rightarrow((m2_dtconstr X2 X0 X1)\Leftrightarrow(\\ & r1_lang1 X0 X1 (k1_dtconstr (u1_struct_0 X0) (k5_trees_3 (u1_struct_0 \\ & X0)) X2)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\ & X0)))\Rightarrow(\forall X1.((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\ & X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 \\ & X0))))))\Rightarrow(\forall X2.(m2_subset_1 X2 (u1_struct_0 (k5_msafree \\ & X0 X1)) (k7_dtconstr (k5_msafree X0 X1)))\Rightarrow(\forall X3.(m1_trees_4 \\ & X3 (k5_trees_3 (u1_struct_0 (k5_msafree X0 X1))) (k1_msaterm X0 \\ & X1))\Rightarrow((m1_msaterm X3 X0 X1 X2)\Leftrightarrow(m2_dtconstr X3 (k5_msafree X0 X1) \\ & X2)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\ & X0)))\Rightarrow(\forall X1.((v1_relat_1 X1)\wedge((v4_relat_1 X1 (u1_struct_0 \\ & X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 X0))))))\Rightarrow \\ & (k1_msaterm X0 X1 = k4_dtconstr (k5_msafree X0 X1)) \end{aligned} \quad (7)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge(l1_msualg_1 \\ & X0)))\Rightarrow(\forall X1.((v1_relat_1 X1)\wedge((v2_relat_1 X1)\wedge((v4_relat_1 \\ & X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge(v1_partfun1 X1 (u1_struct_0 \\ & X0))))))\Rightarrow(\forall X2.(m1_subset_1 X2 (u4_struct_0 X0))\Rightarrow(\forall X3. \\ & (m1_trees_4 X3 (k5_trees_3 (u1_struct_0 (k5_msafree X0 X1))) (\\ & k1_msaterm X0 X1))\Rightarrow((m1_msaterm X3 X0 X1 (k2_msaterm X0 X1 X2))\Leftrightarrow \\ & (r1_lang1 (k5_msafree X0 X1) (k2_msaterm X0 X1 X2) (k1_dtconstr \\ & (u1_struct_0 (k5_msafree X0 X1)) (k5_trees_3 (u1_struct_0 (k5_msafree \\ & X0 X1)) X3)))))) \end{aligned}$$