t29_osafree (TMHZL9fMkxuWAefiQuspBXBwGAZprv9ZEFq)

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Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $v11\_struct\_0 : \iota \Rightarrow o$ be given. Let $v4\_osalg\_1 : \iota \Rightarrow o$ be given. Let $v5\_osalg\_1 : \iota \Rightarrow o$ be given. Let $v2\_osalg\_4 : \iota \Rightarrow o$ be given. Let $l3\_osalg\_1 : \iota \Rightarrow o$ 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 $k22\_osafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1\_xboole\_0 : \iota \Rightarrow o$ be given. Let $k21\_osafree : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1\_struct\_0 : \iota \Rightarrow o$ be given. Let $l2\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m3\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1\_osalg\_1 : \iota \Rightarrow o$ be given. Let $l2\_osalg\_1 : \iota \Rightarrow o$ be given. Let $l1\_msualg\_1 : \iota \Rightarrow o$ be given. Let $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1\_orders\_2 : \iota \Rightarrow o$ be given. Let $v12\_osalg\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k8\_osafree : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.\forall X1.(X0 \in X1) \Rightarrow (m1\_subset\_1\ X0\ X1) \tag{1}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v4\_osalg\_1\ X0) \wedge ((v5\_osalg\_1\ X0) \wedge ((v2\_osalg\_4\ X0) \wedge (l3\_osalg\_1\ X0)))))) \wedge (((v1\_relat\_1\ X1) \wedge ((v2\_relat\_1\ X1) \wedge ((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0)) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))) \wedge (m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)))) \Rightarrow (\neg v1\_xboole\_0\ (k21\_osafree\ X0\ X1\ X2)) \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.((l1\_struct\_0\ X0) \wedge (l2\_msualg\_1\ X1\ X0)) \Rightarrow ((v1\_relat\_1\ (u3\_msualg\_1\ X0\ X1)) \wedge ((v4\_relat\_1\ (u3\_msualg\_1\ X0\ X1)\ (u1\_struct\_0\ X0)) \wedge ((v1\_funct\_1\ (u3\_msualg\_1\ X0\ X1)) \wedge (v1\_partfun1\ (u3\_msualg\_1\ X0\ X1)\ (u1\_struct\_0\ X0))))) \tag{3}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(\forall X2.(m3\_pboole\ X2\ X0\ X1)\Rightarrow((v1\_relat\_1\ X2)\wedge((v4\_relat\_1\ X2\ X0)\wedge((v1\_funct\_1\ X2)\wedge(v1\_partfun1\ X2\ X0)))))) \tag{4}$$

Assume the following.

$$\forall X0.(l3\_osalg\_1\ X0)\Rightarrow((l1\_osalg\_1\ X0)\wedge(l2\_osalg\_1\ X0)) \tag{5}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge(l1\_msualg\_1\ X0))\Rightarrow(\forall X1.(l3\_msualg\_1\ X1\ X0)\Rightarrow(l2\_msualg\_1\ X1\ X0)) \tag{6}$$

Assume the following.

$$\forall X0.(l2\_osalg\_1\ X0)\Rightarrow((l1\_msualg\_1\ X0)\wedge(l1\_orders\_2\ X0)) \tag{7}$$

Assume the following.

$$\forall X0.(l1\_orders\_2\ X0)\Rightarrow(l1\_struct\_0\ X0) \tag{8}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge(l3\_osalg\_1\ X0)))))\wedge((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0))))))\Rightarrow((v12\_osalg\_1\ (k8\_osafree\ X0\ X1)\ X0)\wedge(l3\_msualg\_1\ (k8\_osafree\ X0\ X1)\ X0)) \tag{9}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge((v2\_osalg\_4\ X0)\wedge(l3\_osalg\_1\ X0))))))\wedge((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))))\Rightarrow(m3\_pboole\ (k22\_osafree\ X0\ X1)\ (u1\_struct\_0\ X0)\ (u3\_msualg\_1\ X0\ (k8\_osafree\ X0\ X1))) \tag{10}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge((v2\_osalg\_4\ X0)\wedge(l3\_osalg\_1\ X0))))))\Rightarrow(\forall X1.((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0)))))))\Rightarrow(\forall X2.(m3\_pboole\ X2\ (u1\_struct\_0\ X0)\ (u3\_msualg\_1\ X0\ (k8\_osafree\ X0\ X1)))\Rightarrow((X2 = k22\_osafree\ X0\ X1)\Leftrightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(k1\_funct\_1\ X2\ X3 = k21\_osafree\ X0\ X1\ X3))))) \tag{11}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow((v2\_relat\_1\ X1)\Leftrightarrow(\forall X2. \neg(X2\in X0)\wedge(v1\_xboole\_0\ (k1\_funct\_1\ X1\ X2)))) \tag{12}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v4\_osalg\_1\ X0)\wedge((v5\_osalg\_1\ X0)\wedge((v2\_osalg\_4\ X0)\wedge(l3\_osalg\_1\ X0))))))\Rightarrow (\forall X1.((v1\_relat\_1\ X1)\wedge((v2\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ (u1\_struct\_0\ X0))\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ (u1\_struct\_0\ X0))))))\Rightarrow(v2\_relat\_1\ (k22\_osafree\ X0\ X1)))$$