

t10_osalg_3 (TMUGQxQFD- phDX8XXuQsHoPAHTA6DKz3Aze2)

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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 $l3_osalg_1 : \iota \Rightarrow o$ be given. Let $v4_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v12_osalg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l3_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r3_osalg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_orders_2 : \iota \Rightarrow o$ be given. Let $v4_orders_2 : \iota \Rightarrow o$ be given. Let $v5_orders_2 : \iota \Rightarrow o$ be given. Let $l1_orders_2 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ 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 $v11_osalg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_relat_1 : \iota \Rightarrow o$ be given. Let $m2_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_osalg_3 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u3_msualg_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_msualg_1 : \iota \Rightarrow o$ be given. Let $r4_msualg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_osalg_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l2_msualg_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_osalg_1 : \iota \Rightarrow o$ be given. Let $l2_osalg_1 : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2_struct_0 X0) \wedge ((v3_orders_2 X0) \wedge ((v4_orders_2 \\
 & X0) \wedge ((v5_orders_2 X0) \wedge (l1_orders_2 X0)))) \Rightarrow (\forall X1. ((v1_relat_1 \\
 & X1) \wedge ((v4_relat_1 X1 (u1_struct_0 X0)) \wedge ((v1_funct_1 X1) \wedge ((v1_partfun1 \\
 & X1 (u1_struct_0 X0)) \wedge (v11_osalg_1 X1 X0)))) \Rightarrow (\forall X2. ((v1_relat_1 \\
 & X2) \wedge ((v2_relat_1 X2) \wedge ((v4_relat_1 X2 (u1_struct_0 X0)) \wedge ((v1_funct_1 \\
 & X2) \wedge ((v1_partfun1 X2 (u1_struct_0 X0)) \wedge (v11_osalg_1 X2 X0)))))) \Rightarrow \\
 & (\forall X3. ((v1_relat_1 X3) \wedge ((v2_relat_1 X3) \wedge ((v4_relat_1 \\
 & X3 (u1_struct_0 X0)) \wedge ((v1_funct_1 X3) \wedge ((v1_partfun1 X3 (u1_struct_0 \\
 & X0)) \wedge (v11_osalg_1 X3 X0)))))) \Rightarrow (\forall X4. (m2_pboole X4 (u1_struct_0 \\
 & X0) X1 X2) \Rightarrow (\forall X5. (m2_pboole X5 (u1_struct_0 X0) X2 X3) \Rightarrow ((\\
 & (v1_osalg_3 X4 X0) \wedge (v1_osalg_3 X5 X0)) \Rightarrow (v1_osalg_3 (k3_msualg_3 \\
 & (u1_struct_0 X0) X1 X2 X3 X4 X5) X0))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v4_osalg_1 \\ X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \Rightarrow (\forall X1.(l3_msualg_1 \\ X1 X0) \Rightarrow ((v12_osalg_1 X1 X0) \Leftrightarrow ((v1_relat_1 (u3_msualg_1 X0 X1)) \wedge \\ ((v4_relat_1 (u3_msualg_1 X0 X1) (u1_struct_0 X0)) \wedge ((v1_funct_1 \\ (u3_msualg_1 X0 X1)) \wedge ((v1_partfun1 (u3_msualg_1 X0 X1) (u1_struct_0 \\ X0)) \wedge (v11_osalg_1 (u3_msualg_1 X0 X1) X0))))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_msualg_1 \\ X0))) \Rightarrow (\forall X1.((v4_msualg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow \\ (\forall X2.((v4_msualg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow (\forall X3. \\ ((v4_msualg_1 X3 X0) \wedge (l3_msualg_1 X3 X0)) \Rightarrow (\forall X4.(m2_pboole \\ X4 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \Rightarrow (\forall X5. \\ (m2_pboole X5 (u1_struct_0 X0) (u3_msualg_1 X0 X2) (u3_msualg_1 \\ X0 X3)) \Rightarrow (((r4_msualg_3 X0 X1 X2 X4) \wedge (r4_msualg_3 X0 X2 X3 X5)) \Rightarrow (\\ r4_msualg_3 X0 X1 X3 (k3_msualg_3 (u1_struct_0 X0) (u3_msualg_1 \\ X0 X1) (u3_msualg_1 X0 X2) (u3_msualg_1 X0 X3) X4 X5)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ X0) \wedge ((v4_osalg_1 X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \wedge \\ (((v4_msualg_1 X1 X0) \wedge ((v12_osalg_1 X1 X0) \wedge (l3_msualg_1 X1 X0))) \wedge \\ ((v4_msualg_1 X2 X0) \wedge ((v12_osalg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)))) \Rightarrow \\ ((r3_osalg_3 X0 X1 X2) \Leftrightarrow (r1_osalg_3 X0 X1 X2)) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.((l1_struct_0 X0) \wedge ((v4_msualg_1 X1 X0) \wedge \\ (l2_msualg_1 X1 X0))) \Rightarrow ((v1_relat_1 (u3_msualg_1 X0 X1)) \wedge ((v2_relat_1 \\ (u3_msualg_1 X0 X1)) \wedge ((v4_relat_1 (u3_msualg_1 X0 X1) (u1_struct_0 \\ X0)) \wedge ((v1_funct_1 (u3_msualg_1 X0 X1)) \wedge (v1_partfun1 (u3_msualg_1 \\ X0 X1) (u1_struct_0 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.(l3_osalg_1 X0) \Rightarrow ((l1_osalg_1 X0) \wedge (l2_osalg_1 X0)) \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge (l1_msualg_1 X0)) \Rightarrow (\forall X1. \\ (l3_msualg_1 X1 X0) \Rightarrow (l2_msualg_1 X1 X0)) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0.(l2_osalg_1 X0) \Rightarrow ((l1_msualg_1 X0) \wedge (l1_orders_2 X0)) \quad (8)$$

Assume the following.

$$\forall X0.(l1_orders_2 X0) \Rightarrow (l1_struct_0 X0) \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & (((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 \\ & \quad X1 X0)))) \wedge (((v1_relat_1 X2) \wedge ((v2_relat_1 X2) \wedge ((v4_relat_1 X2 \\ & \quad X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \wedge (((v1_relat_1 \\ & \quad X3) \wedge ((v2_relat_1 X3) \wedge ((v4_relat_1 X3 X0) \wedge ((v1_funct_1 X3) \wedge (\\ & \quad v1_partfun1 X3 X0)))))) \wedge ((m2_pboole X4 X0 X1 X2) \wedge (m2_pboole X5 X0 \\ & \quad X2 X3)))) \Rightarrow (m2_pboole (k3_msualg_3 X0 X1 X2 X3 X4 X5) X0 X1 X3) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v4_osalg_1 \\ & \quad X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \Rightarrow (\forall X1.((v12_osalg_1 \\ & \quad X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\forall X2.((v12_osalg_1 X2 X0) \wedge \\ & \quad (l3_msualg_1 X2 X0)) \Rightarrow ((r1_osalg_3 X0 X1 X2) \Leftrightarrow (\exists X3.(m2_pboole \\ & \quad X3 (u1_struct_0 X0) (u3_msualg_1 X0 X1) (u3_msualg_1 X0 X2)) \wedge ((\\ & \quad r4_msualg_3 X0 X1 X2 X3) \wedge (v1_osalg_3 X3 X0)))))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0.(l3_osalg_1 X0) \Rightarrow ((v4_osalg_1 X0) \Rightarrow ((v3_orders_2 X0) \wedge ((v4_orders_2 X0) \wedge (v5_orders_2 X0)))) \quad (12)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v4_osalg_1 \\ & \quad X0) \wedge ((v5_osalg_1 X0) \wedge (l3_osalg_1 X0)))))) \Rightarrow (\forall X1.((v4_msualg_1 \\ & \quad X1 X0) \wedge ((v12_osalg_1 X1 X0) \wedge (l3_msualg_1 X1 X0)) \Rightarrow (\forall X2. \\ & \quad ((v4_msualg_1 X2 X0) \wedge ((v12_osalg_1 X2 X0) \wedge (l3_msualg_1 X2 X0)) \Rightarrow \\ & \quad (\forall X3.((v4_msualg_1 X3 X0) \wedge ((v12_osalg_1 X3 X0) \wedge (l3_msualg_1 \\ & \quad X3 X0)) \Rightarrow ((r3_osalg_3 X0 X1 X2) \wedge (r3_osalg_3 X0 X2 X3)) \Rightarrow (r3_osalg_3 \\ & \quad X0 X1 X3)))))) \end{aligned}$$