

## t27\_autalg\_1

(TMP3DWz34563QdsVtWtYC4N5E32bqpHdmCZ)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_unialg\_1 : \iota \Rightarrow o$  be given. Let  $v3\_unialg\_1 : \iota \Rightarrow o$  be given. Let  $v4\_unialg\_1 : \iota \Rightarrow o$  be given. Let  $l1\_unialg\_1 : \iota \Rightarrow o$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $u3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_msualg\_1 : \iota \Rightarrow \iota$  be given. Let  $m2\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_autalg\_1 : \iota \Rightarrow \iota$  be given. Let  $k16\_funcop\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k5\_autalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $l1\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $v3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v4\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l3\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_msuhom\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  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  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r4\_alg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r4\_msualg\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_msuhom\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v7\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_struct\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $np\_1 : \iota$  be given. Let  $v5\_msualg\_1 : \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Let  $k4\_autalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v1\_msualg\_1 \\ X0) \wedge (l1\_msualg\_1 X0)))) \Rightarrow (\forall X1. ((v3\_msualg\_1 X1 X0) \wedge (( \\ v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow (X1 = k1\_msuhom\_1 X0 X0 \\ X1)) \end{aligned} \tag{1}$$

Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \tag{2}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow (\forall X1.((\neg \\ v2\_struct\_0 X1) \wedge ((v2\_unialg\_1 X1) \wedge ((v3\_unialg\_1 X1) \wedge ((v4\_unialg\_1 \\ X1) \wedge (l1\_unialg\_1 X1)))))) \Rightarrow (\forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 \\ X2 (u1\_struct\_0 X0) (u1\_struct\_0 X1)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X1)))))) \Rightarrow ((r4\_alg\_1 \\ X0 X1 X2) \Rightarrow (r4\_msualg\_3 (k6\_msualg\_1 X0) (k9\_msualg\_1 X0) (k1\_msuhom\_1 \\ (k6\_msualg\_1 X0) (k6\_msualg\_1 X1) (k9\_msualg\_1 X1) (k2\_msuhom\_1 \\ X0 X1 X2)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X1) \wedge (m1\_funct\_2 \\ X2 X0 X1)) \Rightarrow (\forall X3. (m2\_funct\_2 X3 X0 X1 X2) \Leftrightarrow (m1\_subset\_1 X3 \\ X2)) \quad (4)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow ((v3\_msualg\_1 ( \\ k9\_msualg\_1 X0) (k6\_msualg\_1 X0)) \wedge (v4\_msualg\_1 (k9\_msualg\_1 \\ X0) (k6\_msualg\_1 X0))) \quad (5)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 \\ (u1\_struct\_0 X0)) \quad (6)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow ((v7\_struct\_0 ( \\ k6\_msualg\_1 X0)) \wedge ((\neg v11\_struct\_0 (k6\_msualg\_1 X0)) \wedge ((v13\_struct\_0 \\ (k6\_msualg\_1 X0) np\_1) \wedge ((v1\_msualg\_1 (k6\_msualg\_1 X0)) \wedge (v5\_msualg\_1 \\ (k6\_msualg\_1 X0)))))) \quad (7)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X1) \wedge (m1\_funct\_2 \\ X2 X0 X1)) \Rightarrow (\forall X3. (m2\_funct\_2 X3 X0 X1 X2) \Rightarrow ((v1\_funct\_1 X3) \wedge \\ ((v1\_funct\_2 X3 X0 X1) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ X0 X1)))))) \quad (8)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (m1\_funct\_2 X2 X0 X1) \Rightarrow (\neg v1\_xboole\_0 \\ X2) \quad (9)$$

Assume the following.

$$\forall X0.(l5\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (10)$$

Assume the following.

$$\forall X0.(l1\_unialg\_1 X0) \Rightarrow (l1\_struct\_0 X0) \quad (11)$$

Assume the following.

$$\forall X0.(l1\_msualg\_1 X0) \Rightarrow (l5\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow ((v3\_msualg\_1 ( \\ k9\_msualg\_1 X0) (k6\_msualg\_1 X0)) \wedge (l3\_msualg\_1 (k9\_msualg\_1 \\ X0) (k6\_msualg\_1 X0))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow ((v7\_struct\_0 ( \\ k6\_msualg\_1 X0)) \wedge ((\neg v11\_struct\_0 (k6\_msualg\_1 X0)) \wedge ((v1\_msualg\_1 \\ (k6\_msualg\_1 X0)) \wedge ((v5\_msualg\_1 (k6\_msualg\_1 X0)) \wedge (l1\_msualg\_1 \\ (k6\_msualg\_1 X0)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge \\ (l1\_msualg\_1 X0))) \wedge ((v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0))) \Rightarrow \\ ((\neg v1\_xboole\_0 (k5\_autalg\_1 X0 X1)) \wedge (m1\_subset\_1 (k5\_autalg\_1 \\ X0 X1) (k1\_zfmisc\_1 (k4\_autalg\_1 (u1\_struct\_0 X0) (u3\_msualg\_1 \\ X0 X1) (u3\_msualg\_1 X0 X1)))))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\ X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow (m1\_funct\_2 (k1\_autalg\_1 \\ X0) (u1\_struct\_0 X0) (u1\_struct\_0 X0)) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_msualg\_1 \\ X0))) \Rightarrow (\forall X1.((v4\_msualg\_1 X1 X0) \wedge (l3\_msualg\_1 X1 X0)) \Rightarrow \\ (\forall X2.((\neg v1\_xboole\_0 X2) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ (k4\_autalg\_1 (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X1) (u3\_msualg\_1 \\ X0 X1)))))) \Rightarrow ((X2 = k5\_autalg\_1 X0 X1) \Leftrightarrow (\forall X3.(m2\_pboole X3 \\ (u1\_struct\_0 X0) (u3\_msualg\_1 X0 X1) (u3\_msualg\_1 X0 X1)) \Rightarrow ((X3 \in \\ X2) \Leftrightarrow (r4\_msualg\_3 X0 X1 X1 X3)))))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\
& \quad X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow (\forall X1.((\neg \\
& \quad v2\_struct\_0 X1) \wedge ((v2\_unialg\_1 X1) \wedge ((v3\_unialg\_1 X1) \wedge ((v4\_unialg\_1 \\
& \quad X1) \wedge (l1\_unialg\_1 X1)))))) \Rightarrow (\forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 \\
& \quad X2 (u1\_struct\_0 X0) (u1\_struct\_0 X1)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\
& \quad (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X1)))))) \Rightarrow ((k6\_msualg\_1 \\
& \quad X0 = k6\_msualg\_1 X1) \Rightarrow (k2\_msuhom\_1 X0 X1 X2 = k16\_funcop\_1 k6\_numbers \\
& \quad X2))))
\end{aligned} \tag{18}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\
& \quad X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow (\forall X1.(m1\_funct\_2 \\
& \quad X1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) \Rightarrow ((X1 = k1\_autalg\_1 X0) \Leftrightarrow ( \\
& \quad \forall X2.((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 (u1\_struct\_0 X0) \\
& \quad (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\
& \quad (u1\_struct\_0 X0) (u1\_struct\_0 X0)))))) \Rightarrow ((X2 \in X1) \Leftrightarrow (r4\_alg\_1 X0 \\
& \quad X0 X2))))))
\end{aligned} \tag{19}$$

Assume the following.

$$\forall X0.(l1\_struct\_0 X0) \Rightarrow ((v13\_struct\_0 X0 np\_1) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge (v7\_struct\_0 X0))) \tag{20}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_unialg\_1 X0) \wedge ((v3\_unialg\_1 \\
& \quad X0) \wedge ((v4\_unialg\_1 X0) \wedge (l1\_unialg\_1 X0)))))) \Rightarrow (\forall X1.(m2\_pboole \\
& \quad X1 (u1\_struct\_0 (k6\_msualg\_1 X0)) (u3\_msualg\_1 (k6\_msualg\_1 X0) \\
& \quad (k9\_msualg\_1 X0)) (u3\_msualg\_1 (k6\_msualg\_1 X0) (k9\_msualg\_1 \\
& \quad X0))) \Rightarrow (\forall X2.(m2\_funct\_2 X2 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& \quad X0) (k1\_autalg\_1 X0)) \Rightarrow ((X1 = k16\_funcop\_1 k6\_numbers X2) \Rightarrow (X1 \in \\
& \quad k5\_autalg\_1 (k6\_msualg\_1 X0) (k9\_msualg\_1 X0))))))
\end{aligned}$$