

# t31\_xxreal\_3 (TMRwnAXUVh- dAMyQ6iLdr4HEj1kBcf3mR2Nz)

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Let  $v1\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $k1\_xxreal\_0 : \iota$  be given. Let  $k2\_xxreal\_0 : \iota$  be given. Let  $k3\_xxreal\_3 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xxreal\_3 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_xxreal\_3 : \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $v1\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (k2\_xxreal\_3 (k1\_xxreal\_3 X0 X1) = k1\_xxreal\_3 (k2\_xxreal\_3 X0) (k2\_xxreal\_3 X1))) \quad (1)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow ((k1\_xxreal\_3 X0 X1 = k6\_numbers) \Rightarrow (X0 = k2\_xxreal\_3 X1))) \quad (2)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (k1\_xxreal\_3 X0 (k2\_xxreal\_3 X0) = k6\_numbers) \quad (3)$$

Assume the following.

$$k2\_xxreal\_3 k2\_xxreal\_0 = k1\_xxreal\_0 \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\forall X2. \\ & (v1\_xxreal\_0 X2) \Rightarrow (\neg(\neg(X0 = k1\_xxreal\_0) \wedge (X1 = k2\_xxreal\_0)) \wedge \\ & ((\neg(X0 = k2\_xxreal\_0) \wedge (X1 = k1\_xxreal\_0)) \wedge (\neg(X1 = k1\_xxreal\_0) \wedge \\ & (X2 = k2\_xxreal\_0)) \wedge (\neg(X1 = k2\_xxreal\_0) \wedge (X2 = k1\_xxreal\_0)) \wedge \\ & ((\neg(X0 = k1\_xxreal\_0) \wedge (X2 = k2\_xxreal\_0)) \wedge (\neg(X0 = k2\_xxreal\_0) \wedge \\ & (X2 = k1\_xxreal\_0)) \wedge (k1\_xxreal\_3 (k1\_xxreal\_3 X0 X1) X2 \neq k1\_xxreal\_3 \\ & X0 (k1\_xxreal\_3 X1 X2)))))))))) \quad (5) \end{aligned}$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (( \\ k2\_xxreal\_3 (k1\_xxreal\_3 (k2\_xxreal\_3 X0) X1) = k3\_xxreal\_3 X0 \\ X1) \wedge (k2\_xxreal\_3 (k1\_xxreal\_3 (k2\_xxreal\_3 X0) X1) = k1\_xxreal\_3 \\ X0 (k2\_xxreal\_3 X1)))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (( \\ k2\_xxreal\_3 (k3\_xxreal\_3 X0 X1) = k1\_xxreal\_3 (k2\_xxreal\_3 X0) \\ X1) \wedge (k2\_xxreal\_3 (k3\_xxreal\_3 X0 X1) = k3\_xxreal\_3 X1 X0))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (k2\_xxreal\_3 \\ (k1\_xxreal\_3 X0 X1) = k3\_xxreal\_3 (k2\_xxreal\_3 X1) X0)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (((X0 = k1\_xxreal\_0) \Rightarrow (k2\_xxreal\_3 \\ X0 = k2\_xxreal\_0)) \wedge (((k2\_xxreal\_3 X0 = k2\_xxreal\_0) \Rightarrow (X0 = k1\_xxreal\_0)) \wedge \\ (((X0 = k2\_xxreal\_0) \Rightarrow (k2\_xxreal\_3 X0 = k1\_xxreal\_0)) \wedge ((k2\_xxreal\_3 \\ X0 = k1\_xxreal\_0) \Rightarrow (X0 = k2\_xxreal\_0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (( \\ v1\_xxreal\_0 X0) \Rightarrow ((k1\_xxreal\_3 (k3\_xxreal\_3 X1 X0) X0 = X1) \wedge (k3\_xxreal\_3 \\ (k1\_xxreal\_3 X1 X0) X0 = X1)))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\neg \\ (\neg(X0 = k1\_xxreal\_0) \wedge (X1 = k1\_xxreal\_0)) \wedge ((\neg(X0 = k2\_xxreal\_0) \wedge \\ (X1 = k2\_xxreal\_0)) \wedge ((k3\_xxreal\_3 X0 X1 \in k1\_numbers) \wedge (\neg(X0 \in k1\_numbers) \wedge \\ (X1 \in k1\_numbers))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\neg \\ (\neg(X0 = k1\_xxreal\_0) \wedge (X1 = k2\_xxreal\_0)) \wedge ((\neg(X0 = k2\_xxreal\_0) \wedge \\ (X1 = k1\_xxreal\_0)) \wedge ((k1\_xxreal\_3 X0 X1 \in k1\_numbers) \wedge (\neg(X0 \in k1\_numbers) \wedge \\ (X1 \in k1\_numbers))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\neg \\ (k3\_xxreal\_3 X0 X1 = k2\_xxreal\_0) \wedge ((X0 \neq k2\_xxreal\_0) \wedge (X1 \neq k1\_xxreal\_0)))) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\neg (k3\_xxreal\_3 X0 X1 = k1\_xxreal\_0) \wedge ((X0 \neq k1\_xxreal\_0) \wedge (X1 \neq k2\_xxreal\_0)))) \quad (14)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (k3\_xxreal\_3 X0 k6\_numbers = X0) \quad (15)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow ((X0 \neq k2\_xxreal\_0) \Rightarrow ((k3\_xxreal\_3 k2\_xxreal\_0 X0 = k2\_xxreal\_0) \wedge (k3\_xxreal\_3 X0 k2\_xxreal\_0 = k1\_xxreal\_0))) \quad (16)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\neg(\neg X0 \in k1\_numbers) \wedge ((X0 \neq k1\_xxreal\_0) \wedge (X0 \neq k2\_xxreal\_0))) \quad (17)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow ((X0 \neq k1\_xxreal\_0) \Rightarrow ((k3\_xxreal\_3 k1\_xxreal\_0 X0 = k1\_xxreal\_0) \wedge (k3\_xxreal\_3 X0 k1\_xxreal\_0 = k2\_xxreal\_0))) \quad (18)$$

Assume the following.

$$k2\_xxreal\_3 k1\_xxreal\_0 = k2\_xxreal\_0 \quad (19)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\neg (k1\_xxreal\_3 X0 X1 = k2\_xxreal\_0) \wedge ((X0 \neq k2\_xxreal\_0) \wedge (X1 \neq k2\_xxreal\_0)))) \quad (20)$$

Assume the following.

$$k2\_xxreal\_3 (k1\_xxreal\_3 k1\_xxreal\_0 k2\_xxreal\_0) = k3\_xxreal\_3 (k2\_xxreal\_3 k2\_xxreal\_0) k1\_xxreal\_0 \quad (21)$$

Assume the following.

$$k1\_xxreal\_3 k1\_xxreal\_0 k1\_xxreal\_0 = k1\_xxreal\_0 \quad (22)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (k2\_xxreal\_3 (k2\_xxreal\_3 X0) = X0) \quad (23)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xxreal\_0 X0) \wedge (v1\_xxreal\_0 X1)) \Rightarrow ((v1\_xxreal\_0 (k3\_xxreal\_3 X0 X1)) \wedge (v1\_xxreal\_0 (k3\_xxreal\_3 X0 X1))) \quad (24)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xreal\_0 X0)\wedge(v1\_xreal\_0 X1))\Rightarrow((v1\_xxreal\_0 (k1\_xxreal\_3 X0 X1))\wedge(v1\_xreal\_0 (k1\_xxreal\_3 X0 X1))) \quad (25)$$

Assume the following.

$$v1\_xxreal\_0 k2\_xxreal\_0 \quad (26)$$

Assume the following.

$$\forall X0.(v1\_xreal\_0 X0)\Rightarrow((v1\_xxreal\_0 (k2\_xxreal\_3 X0))\wedge(v1\_xreal\_0 (k2\_xxreal\_3 X0))) \quad (27)$$

Assume the following.

$$v1\_xxreal\_0 k1\_xxreal\_0 \quad (28)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xxreal\_0 X0)\wedge(v1\_xxreal\_0 X1))\Rightarrow(v1\_xxreal\_0 (k3\_xxreal\_3 X0 X1)) \quad (29)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0)\Rightarrow(v1\_xxreal\_0 (k2\_xxreal\_3 X0)) \quad (30)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xxreal\_0 X0)\wedge(v1\_xxreal\_0 X1))\Rightarrow(v1\_xxreal\_0 (k1\_xxreal\_3 X0 X1)) \quad (31)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0)\Rightarrow(\forall X1.(v1\_xxreal\_0 X1)\Rightarrow(k3\_xxreal\_3 X0 X1 = k1\_xxreal\_3 X0 (k2\_xxreal\_3 X1))) \quad (32)$$

Assume the following.

$$k1\_xxreal\_0 = k1\_numbers \quad (33)$$

Assume the following.

$$\forall X0.(v1\_xreal\_0 X0)\Leftrightarrow(X0 \in k1\_numbers) \quad (34)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xxreal\_0 X0)\wedge(v1\_xxreal\_0 X1))\Rightarrow(k1\_xxreal\_3 X0 X1 = k1\_xxreal\_3 X1 X0) \quad (35)$$

Assume the following.

$$\forall X0.\forall X1.(X0 \in X1)\Rightarrow(\neg X1 \in X0) \quad (36)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\forall X2. \\ & (v1\_xxreal\_0 X2) \Rightarrow (\neg(\neg(X0 = k1\_xxreal\_0) \wedge (X1 = k1\_xxreal\_0)) \wedge \\ & ((\neg(X0 = k2\_xxreal\_0) \wedge (X1 = k2\_xxreal\_0)) \wedge (\neg(X1 = k1\_xxreal\_0) \wedge \\ & (X2 = k2\_xxreal\_0)) \wedge (\neg(X1 = k2\_xxreal\_0) \wedge (X2 = k1\_xxreal\_0)) \wedge \\ & ((\neg(X0 = k1\_xxreal\_0) \wedge (X2 = k1\_xxreal\_0)) \wedge (\neg(X0 = k2\_xxreal\_0) \wedge \\ & (X2 = k2\_xxreal\_0)) \wedge (k3\_xxreal\_3 (k3\_xxreal\_3 X0 X1) X2 \neq k3\_xxreal\_3 \\ & X0 (k1\_xxreal\_3 X1 X2)))))))))) \end{aligned}$$