

t58\_funct\_7 (TMFQcMx-  
Siv9rbayEcGUpXRmfCZtp3AkGRL4)

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Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_finseq\_1 : \iota \Rightarrow o$  be given. Let  $k6\_funct\_7 : \iota \Rightarrow \iota$  be given. Let  $k7\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k7\_funct\_7 : \iota \Rightarrow \iota$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_nat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $np\_1 : \iota$  be given. Let  $k5\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ X1))) \Rightarrow (k1\_funct\_1 (k7\_finseq\_1 X1 (k9\_finseq\_1 X0)) (k2\_nat\_1 \\ (k3\_finseq\_1 X1) np\_1) = X0) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ X1))) \Rightarrow (k1\_funct\_1 (k7\_finseq\_1 (k9\_finseq\_1 X0) X1) np\_1 = X0) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ X1))) \Rightarrow ((X1 = k9\_finseq\_1 X0) \Leftrightarrow ((k3\_finseq\_1 X1 = np\_1) \wedge (k1\_funct\_1 \\ X1 np\_1 = X0))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0. ((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \Rightarrow \\ (\forall X1. ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 \\ X1)))) \Rightarrow (k3\_finseq\_1 (k7\_finseq\_1 X0 X1) = k2\_nat\_1 (k3\_finseq\_1 \\ X0) (k3\_finseq\_1 X1))) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0. k9\_finseq\_1 X0 = k5\_finseq\_1 X0 \quad (5)$$

Assume the following.

$$\forall X0. v1\_finseq\_1 (k5\_finseq\_1 X0) \quad (6)$$

Assume the following.

$$\forall X0.(v1\_relat\_1 (k5\_finseq\_1 X0)) \wedge (v1\_funct\_1 (k5\_finseq\_1 X0)) \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \wedge ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge ((\neg v1\_xboole\_0 X1) \wedge (v1\_finseq\_1 X1)))))) \Rightarrow ((v1\_relat\_1 (k7\_finseq\_1 X1 X0)) \wedge ((v1\_funct\_1 (k7\_finseq\_1 X1 X0)) \wedge ((\neg v1\_xboole\_0 (k7\_finseq\_1 X1 X0)) \wedge (v1\_finseq\_1 (k7\_finseq\_1 X1 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \wedge ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge ((\neg v1\_xboole\_0 X1) \wedge (v1\_finseq\_1 X1)))))) \Rightarrow ((v1\_relat\_1 (k7\_finseq\_1 X0 X1)) \wedge ((v1\_funct\_1 (k7\_finseq\_1 X0 X1)) \wedge ((\neg v1\_xboole\_0 (k7\_finseq\_1 X0 X1)) \wedge (v1\_finseq\_1 (k7\_finseq\_1 X0 X1)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\forall X0.\neg v1\_xboole\_0 (k5\_finseq\_1 X0) \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \wedge ((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 X1)))) \Rightarrow ((v1\_relat\_1 (k7\_finseq\_1 X0 X1)) \wedge ((v1\_funct\_1 (k7\_finseq\_1 X0 X1)) \wedge (v1\_finseq\_1 (k7\_finseq\_1 X0 X1)))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \Rightarrow ((\forall X1.((v1\_xboole\_0 X0) \Rightarrow ((X1 = k7\_funct\_7 X0) \Leftrightarrow (v1\_xboole\_0 X1))) \wedge ((\neg v1\_xboole\_0 X0) \Rightarrow ((X1 = k7\_funct\_7 X0) \Leftrightarrow (X1 = k10\_xtuple\_0 (k1\_funct\_1 X0 (k3\_finseq\_1 X0))))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finseq\_1 X0))) \Rightarrow ((\forall X1.((v1\_xboole\_0 X0) \Rightarrow ((X1 = k6\_funct\_7 X0) \Leftrightarrow (v1\_xboole\_0 X1))) \wedge ((\neg v1\_xboole\_0 X0) \Rightarrow ((X1 = k6\_funct\_7 X0) \Leftrightarrow (X1 = k9\_xtuple\_0 (k1\_funct\_1 X0 np\_1)))))) \end{aligned} \quad (13)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finseq\_1 X1))) \Rightarrow ((k6\_funct\_7 (k7\_finseq\_1 (k9\_finseq\_1 X0) X1) = k9\_xtuple\_0 X0) \wedge (k7\_funct\_7 (k7\_finseq\_1 X1 (k9\_finseq\_1 X0)) = k10\_xtuple\_0 X0))) \end{aligned}$$