

t51\_helly  
(TMTVfqUbZN9fLXv62zUjUboNfzZ3KFMbLzc)

October 27, 2020

Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_numbers : \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_finset\_1 : \iota \Rightarrow o$  be given. Let  $v1\_glib\_000 : \iota \Rightarrow o$  be given. Let  $v3\_glib\_002 : \iota \Rightarrow o$  be given. Let  $v5\_glib\_001 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m3\_glib\_001 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_glib\_000 : \iota \Rightarrow \iota$  be given. Let  $k2\_helly : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_glib\_001 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_helly : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_finseq\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_helly : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k9\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. (r1\_tarski (k1\_tarski X0) (k1\_tarski X1)) \Rightarrow (X0 = X1) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v1\_funct\_1 \\ & X0) \wedge ((v1\_finset\_1 X0) \wedge ((v1\_glib\_000 X0) \wedge (v3\_glib\_002 X0)))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (k6\_glib\_000 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 \\ & X2 (k6\_glib\_000 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (k6\_glib\_000 \\ & X0)) \Rightarrow ((X3 \in k13\_glib\_001 X0 (k2\_helly X0 X1 X2)) \Leftrightarrow (r1\_tarski (k2\_helly \\ & X0 X1 X3) (k2\_helly X0 X1 X2)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. r1\_tarski X0 X0 \quad (3)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v1\_funct\_1 \\
& X0) \wedge ((v1\_finset\_1 X0) \wedge ((v1\_glib\_000 X0) \wedge (v3\_glib\_002 X0)))))) \Rightarrow \\
& (\forall X1.(m1\_subset\_1 X1 (k6\_glib\_000 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 \\
& X2 (k6\_glib\_000 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k6\_glib\_000 \\
& X0)) \Rightarrow (\forall X4.((v5\_glib\_001 X4 X0) \wedge (m3\_glib\_001 X4 X0)) \Rightarrow ( \\
& \forall X5.((v5\_glib\_001 X5 X0) \wedge (m3\_glib\_001 X5 X0)) \Rightarrow (((X4 = k2\_helly \\
& X0 X1 X2) \wedge (X5 = k2\_helly X0 X1 X3)) \Rightarrow ((r1\_tarski X4 X5) \vee ((r1\_tarski \\
& X5 X4) \vee (k9\_subset\_1 (k6\_glib\_000 X0) (k9\_subset\_1 (k6\_glib\_000 \\
& X0) (k13\_glib\_001 X0 X4) (k13\_glib\_001 X0 (k2\_helly X0 X2 X3))) ( \\
& k13\_glib\_001 X0 (k2\_helly X0 X3 X1)) = k1\_tarski (k1\_funct\_1 X4 ( \\
& k3\_finseq\_1 (k1\_helly X4 X5))))))))))))) \\
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (((v1\_relat\_1 X0) \wedge \\
& ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v1\_funct\_1 X0) \wedge ((v1\_finset\_1 \\
& X0) \wedge ((v1\_glib\_000 X0) \wedge (v3\_glib\_002 X0)))))) \wedge ((m1\_subset\_1 \\
& X1 (k6\_glib\_000 X0)) \wedge ((m1\_subset\_1 X2 (k6\_glib\_000 X0)) \wedge (m1\_subset\_1 \\
& X3 (k6\_glib\_000 X0)))) \Rightarrow (m1\_subset\_1 (k3\_helly X0 X1 X2 X3) (k6\_glib\_000 \\
& X0)) \\
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v1\_funct\_1 \\
& X0) \wedge ((v1\_finset\_1 X0) \wedge ((v1\_glib\_000 X0) \wedge (v3\_glib\_002 X0)))))) \Rightarrow \\
& (\forall X1.(m1\_subset\_1 X1 (k6\_glib\_000 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 \\
& X2 (k6\_glib\_000 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k6\_glib\_000 \\
& X0)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (k6\_glib\_000 X0)) \Rightarrow ((X4 = k3\_helly \\
& X0 X1 X2 X3) \Leftrightarrow (k9\_subset\_1 (k6\_glib\_000 X0) (k9\_subset\_1 (k6\_glib\_000 \\
& X0) (k13\_glib\_001 X0 (k2\_helly X0 X1 X2)) (k13\_glib\_001 X0 (k2\_helly \\
& X0 X2 X3))) (k13\_glib\_001 X0 (k2\_helly X0 X3 X1)) = k1\_tarski X4)))))) \\
\end{aligned} \tag{6}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge ((v4\_relat\_1 X0 k5\_numbers) \wedge ((v1\_funct\_1 \\
& X0) \wedge ((v1\_finset\_1 X0) \wedge ((v1\_glib\_000 X0) \wedge (v3\_glib\_002 X0)))))) \Rightarrow \\
& (\forall X1.((v5\_glib\_001 X1 X0) \wedge (m3\_glib\_001 X1 X0)) \Rightarrow (\forall X2. \\
& ((v5\_glib\_001 X2 X0) \wedge (m3\_glib\_001 X2 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 \\
& X3 (k6\_glib\_000 X0)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (k6\_glib\_000 \\
& X0)) \Rightarrow (\forall X5.(m1\_subset\_1 X5 (k6\_glib\_000 X0)) \Rightarrow (((X1 = k2\_helly \\
& X0 X3 X4) \wedge (X2 = k2\_helly X0 X3 X5)) \Rightarrow ((X4 \in k13\_glib\_001 X0 X2) \vee ((X5 \in \\
& k13\_glib\_001 X0 X1) \vee (k3\_helly X0 X3 X4 X5 = k1\_funct\_1 X1 (k3\_finseq\_1 \\
& (k1\_helly X1 X2))))))))))))) \\
\end{aligned}$$