

t41\_yellow18  
(TML7G6n9x6amrQ6sCNeDVW7E2kgKtnrhNwF)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v9\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v11\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v12\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v2\_yellow18 : \iota \Rightarrow o$  be given. Let  $l2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $v2\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k2\_funct\_1 : \iota \Rightarrow \iota$  be given. Let  $v3\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k3\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_relat\_1 : \iota \Rightarrow \iota$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_partfun1 : \iota \Rightarrow \iota$  be given. Let  $k3\_yellow18 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_tarski : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_altcat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\forall X0. \forall X1. \neg (X0 \in X1) \wedge (v1\_xboole\_0 X1) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow ((v2\_funct\_1 X0) \Rightarrow \\ & ((k3\_relat\_1 X0 (k2\_funct\_1 X0) = k4\_relat\_1 (k9\_xtuple\_0 X0)) \wedge \\ & (k3\_relat\_1 (k2\_funct\_1 X0) X0 = k4\_relat\_1 (k10\_xtuple\_0 X0)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v9\_altcat\_1 \\ & X0) \wedge ((v11\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge ((v2\_yellow18 X0) \wedge \\ & (l2\_altcat\_1 X0))))))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0)) \Rightarrow ((k6\_partfun1 (k3\_yellow18 X0 X1) \in k1\_altcat\_1 X0 X1 X1) \Rightarrow \\ & (k8\_altcat\_1 X0 X1 = k6\_partfun1 (k3\_yellow18 X0 X1)))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v9\_altcat\_1 \\
& X0) \wedge ((v11\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge ((v2\_yellow18 X0) \wedge \\
& (l2\_altcat\_1 X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge \\
& ((k1\_altcat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (\neg \forall X4.(m1\_subset\_1 \\
& X4 (k1\_altcat\_1 X0 X1 X2)) \Rightarrow (\forall X5.(m1\_subset\_1 X5 (k1\_altcat\_1 \\
& X0 X2 X3)) \Rightarrow (k5\_altcat\_1 X0 X1 X2 X3 X4 X5 = k3\_relat\_1 X4 X5))))))))) \\
& \tag{4}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 \\
& X0) \wedge ((v12\_altcat\_1 X0) \wedge ((v2\_yellow18 X0) \wedge (l2\_altcat\_1 X0)))))) \Rightarrow \\
& (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 \\
& X2 (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (k1\_altcat\_1 X0 X1 X2)) \Rightarrow ((k9\_xtuple\_0 X3 = k3\_yellow18 \\
& X0 X1) \wedge (r1\_tarski (k10\_xtuple\_0 X3) (k3\_yellow18 X0 X2))))))))) \\
& \tag{5}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow ((v2\_funct\_1 X0) \Rightarrow \\
& ((k10\_xtuple\_0 X0 = k9\_xtuple\_0 (k2\_funct\_1 X0)) \wedge (k9\_xtuple\_0 \\
& X0 = k10\_xtuple\_0 (k2\_funct\_1 X0)))) \\
& \tag{6}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1.(m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee \\
& (X0 \in X1)) \\
& \tag{7}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1.(X0 \in X1) \Rightarrow (m1\_subset\_1 X0 X1) \\
& \tag{8}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.k6\_partfun1 X0 = k4\_relat\_1 X0 \\
& \tag{9}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& v1\_xboole\_0 k1\_xboole\_0 \\
& \tag{10}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v12\_altcat\_1 X0) \wedge \\
& (l2\_altcat\_1 X0))) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow (\neg v1\_xboole\_0 \\
& (k1\_altcat\_1 X0 X1 X1)) \\
& \tag{11}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2\_struct\_0 X0)\wedge(l2\_altcat\_1 X0))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 \\
& X0))\wedge((m1\_subset\_1 X2 (u1\_struct\_0 X0))\wedge((m1\_subset\_1 X3 (u1\_struct\_0 \\
& X0))\wedge((m1\_subset\_1 X4 (k1\_altcat\_1 X0 X1 X2))\wedge(m1\_subset\_1 X5 \\
& (k1\_altcat\_1 X0 X2 X3))))))\Rightarrow(m1\_subset\_1 (k5\_altcat\_1 X0 X1 X2 \\
& X3 X4 X5) (k1\_altcat\_1 X0 X1 X3))
\end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_altcat\_1 X0)\wedge((v11\_altcat\_1 \\
& X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 X0))))\Rightarrow(\forall X1.(m1\_subset\_1 \\
& X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\
& X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 X0 X1 X2))\Rightarrow((v3\_altcat\_3 \\
& X3 X0 X1 X2)\Leftrightarrow((k5\_altcat\_1 X0 X2 X1 X2 (k1\_altcat\_3 X0 X1 X2 X3) X3 = \\
& k8\_altcat\_1 X0 X2)\wedge(k5\_altcat\_1 X0 X1 X2 X1 X3 (k1\_altcat\_3 X0 X1 \\
& X2 X3) = k8\_altcat\_1 X0 X1))))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v2\_altcat\_1 X0)\wedge((v11\_altcat\_1 \\
& X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 X0))))\Rightarrow(\forall X1.(m1\_subset\_1 \\
& X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\
& X0))\Rightarrow(\neg(k1\_altcat\_1 X0 X1 X2\neq k1\_xboole\_0)\wedge((k1\_altcat\_1 X0 X2 \\
& X1\neq k1\_xboole\_0)\wedge(\exists X3.(m1\_subset\_1 X3 (k1\_altcat\_1 X0 \\
& X1 X2))\wedge((v1\_altcat\_3 X3 X0 X1 X2)\wedge((v2\_altcat\_3 X3 X0 X1 X2)\wedge(\neg \\
& \forall X4.(m1\_subset\_1 X4 (k1\_altcat\_1 X0 X2 X1))\Rightarrow((X4 = k1\_altcat\_3 \\
& X0 X1 X2 X3)\Leftrightarrow((r1\_altcat\_3 X0 X2 X1 X4 X3)\wedge(r1\_altcat\_3 X0 X1 X2 X3 \\
& X4))))))))))
\end{aligned} \tag{14}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 \\
& X0))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\
& (m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 \\
& (k1\_altcat\_1 X0 X1 X2))\Rightarrow((v2\_altcat\_3 X3 X0 X1 X2)\Leftrightarrow(\exists X4. \\
& (m1\_subset\_1 X4 (k1\_altcat\_1 X0 X2 X1))\wedge(r1\_altcat\_3 X0 X2 X1 X4 \\
& X3))))))
\end{aligned} \tag{15}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((v12\_altcat\_1 X0)\wedge(l2\_altcat\_1 \\
& X0))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\
& (m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 \\
& (k1\_altcat\_1 X0 X1 X2))\Rightarrow((v1\_altcat\_3 X3 X0 X1 X2)\Leftrightarrow(\exists X4. \\
& (m1\_subset\_1 X4 (k1\_altcat\_1 X0 X2 X1))\wedge(r1\_altcat\_3 X0 X1 X2 X3 \\
& X4))))))
\end{aligned} \tag{16}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\
& \quad X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\
& \quad (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 \\
& \quad (k1\_altcat\_1 X0 X1 X2)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (k1\_altcat\_1 \\
& \quad X0 X2 X1)) \Rightarrow ((r1\_altcat\_3 X0 X1 X2 X3 X4) \Leftrightarrow (k5\_altcat\_1 X0 X2 X1 X2 X4 \\
& \quad X3 = k8\_altcat\_1 X0 X2))))))
\end{aligned} \tag{17}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 \\
& \quad X0) \wedge ((v11\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge ((v2\_yellow18 X0) \wedge \\
& \quad (l2\_altcat\_1 X0)))))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 \\
& \quad X2 (u1\_struct\_0 X0)))) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 \\
& \quad X0 X1 X2)) \Rightarrow ((v1\_relat\_1 X3) \wedge (v1\_funct\_1 X3)))
\end{aligned} \tag{18}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.(((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v9\_altcat\_1 \\
& \quad X0) \wedge ((v11\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge ((v2\_yellow18 X0) \wedge \\
& \quad (l2\_altcat\_1 X0)))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& \quad X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 \\
& \quad X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 \\
& \quad X0 X1 X2)) \Rightarrow (((v2\_funct\_1 X3) \wedge (k2\_funct\_1 X3 \in k1\_altcat\_1 X0 X2 \\
& \quad X1)) \Rightarrow (v3\_altcat\_3 X3 X0 X1 X2))))))
\end{aligned}$$