

## t35\_isocat\_2

(TMJJDyqriWe7eqFSheYKjSzVnrmHuFjX1de)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v3\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v5\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v6\_cat\_1 : \iota \Rightarrow o$  be given. Let  $l1\_cat\_1 : \iota \Rightarrow o$  be given. Let  $m2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k8\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_cat\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_isocat\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k9\_cat\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k16\_cat\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_funct\_3 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
 & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
 & X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\
 & v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\
 & X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\
 & ((\neg v2\_struct\_0 X2) \wedge ((\neg v11\_struct\_0 X2) \wedge ((v2\_cat\_1 X2) \wedge ((v3\_cat\_1 \\
 & X2) \wedge ((v4\_cat\_1 X2) \wedge ((v5\_cat\_1 X2) \wedge ((v6\_cat\_1 X2) \wedge (l1\_cat\_1 \\
 & X2))))))) \Rightarrow (\forall X3.(m2\_cat\_1 X3 X0 X1) \Rightarrow (\forall X4.(m2\_cat\_1 \\
 & X4 X0 X2) \Rightarrow (\forall X5.(m1\_subset\_1 X5 (u1\_struct\_0 X0)) \Rightarrow (k3\_funct\_2 \\
 & (u1\_struct\_0 X0) (u1\_struct\_0 (k8\_cat\_2 X1 X2)) (k7\_cat\_1 X0 (k8\_cat\_2 \\
 & X1 X2) (k16\_cat\_2 X0 X1 X2 X3 X4)) X5 = k9\_cat\_2 X1 X2 (k3\_funct\_2 (u1\_struct\_0 \\
 & X0) (u1\_struct\_0 X1) (k7\_cat\_1 X0 X1 X3) X5) (k3\_funct\_2 (u1\_struct\_0 \\
 & X0) (u1\_struct\_0 X2) (k7\_cat\_1 X0 X2 X4) X5))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 \\
& X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge((( \\
& \neg v2\_struct\_0 X1)\wedge((\neg v11\_struct\_0 X1)\wedge((v2\_cat\_1 X1)\wedge((v3\_cat\_1 \\
& X1)\wedge((v4\_cat\_1 X1)\wedge((v5\_cat\_1 X1)\wedge((v6\_cat\_1 X1)\wedge(l1\_cat\_1 \\
& X1))))))))\wedge(((\neg v2\_struct\_0 X2)\wedge((\neg v11\_struct\_0 X2)\wedge((v2\_cat\_1 \\
& X2)\wedge((v3\_cat\_1 X2)\wedge((v4\_cat\_1 X2)\wedge((v5\_cat\_1 X2)\wedge((v6\_cat\_1 \\
& X2)\wedge(l1\_cat\_1 X2))))))))\wedge((m2\_cat\_1 X3 X0 X1)\wedge(m2\_cat\_1 X4 X0 \\
& X2))))\Rightarrow(k8\_isocat\_2 X0 X1 X2 X3 X4 = k13\_funct\_3 X3 X4)
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 \\
& X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge((( \\
& \neg v2\_struct\_0 X1)\wedge((\neg v11\_struct\_0 X1)\wedge((v2\_cat\_1 X1)\wedge((v3\_cat\_1 \\
& X1)\wedge((v4\_cat\_1 X1)\wedge((v5\_cat\_1 X1)\wedge((v6\_cat\_1 X1)\wedge(l1\_cat\_1 \\
& X1))))))))\wedge(((\neg v2\_struct\_0 X2)\wedge((\neg v11\_struct\_0 X2)\wedge((v2\_cat\_1 \\
& X2)\wedge((v3\_cat\_1 X2)\wedge((v4\_cat\_1 X2)\wedge((v5\_cat\_1 X2)\wedge((v6\_cat\_1 \\
& X2)\wedge(l1\_cat\_1 X2))))))))\wedge((m2\_cat\_1 X3 X0 X1)\wedge(m2\_cat\_1 X4 X0 \\
& X2))))\Rightarrow(k16\_cat\_2 X0 X1 X2 X3 X4 = k13\_funct\_3 X3 X4)
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge \\
& ((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge \\
& ((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge((\neg v2\_struct\_0 X1)\wedge((\neg \\
& v11\_struct\_0 X1)\wedge((v2\_cat\_1 X1)\wedge((v3\_cat\_1 X1)\wedge((v4\_cat\_1 X1)\wedge \\
& ((v5\_cat\_1 X1)\wedge((v6\_cat\_1 X1)\wedge(l1\_cat\_1 X1))))))))\Rightarrow((\neg v2\_struct\_0 \\
& (k8\_cat\_2 X0 X1)\wedge((\neg v11\_struct\_0 (k8\_cat\_2 X0 X1)\wedge((v2\_cat\_1 \\
& (k8\_cat\_2 X0 X1)\wedge((v3\_cat\_1 (k8\_cat\_2 X0 X1)\wedge((v4\_cat\_1 (k8\_cat\_2 \\
& X0 X1)\wedge((v5\_cat\_1 (k8\_cat\_2 X0 X1)\wedge((v6\_cat\_1 (k8\_cat\_2 X0 X1)\wedge \\
& (l1\_cat\_1 (k8\_cat\_2 X0 X1))))))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 \\
& X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge((( \\
& \neg v2\_struct\_0 X1)\wedge((\neg v11\_struct\_0 X1)\wedge((v2\_cat\_1 X1)\wedge((v3\_cat\_1 \\
& X1)\wedge((v4\_cat\_1 X1)\wedge((v5\_cat\_1 X1)\wedge((v6\_cat\_1 X1)\wedge(l1\_cat\_1 \\
& X1))))))))\wedge(((\neg v2\_struct\_0 X2)\wedge((\neg v11\_struct\_0 X2)\wedge((v2\_cat\_1 \\
& X2)\wedge((v3\_cat\_1 X2)\wedge((v4\_cat\_1 X2)\wedge((v5\_cat\_1 X2)\wedge((v6\_cat\_1 \\
& X2)\wedge(l1\_cat\_1 X2))))))))\wedge((m2\_cat\_1 X3 X0 X1)\wedge(m2\_cat\_1 X4 X0 \\
& X2))))\Rightarrow(m2\_cat\_1 (k16\_cat\_2 X0 X1 X2 X3 X4) X0 (k8\_cat\_2 X1 X2))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge (( \\
& \neg v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\
& X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2\_cat\_1 X2 X0 X1) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0) \Rightarrow \\
& (k8\_cat\_1 X0 X1 X2 X3 = k3\_funct\_2 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X1) (k7\_cat\_1 X0 X1 X2) X3))))
\end{aligned} \tag{6}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge (( \\
& \neg v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\
& X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\
& ((\neg v2\_struct\_0 X2) \wedge ((\neg v11\_struct\_0 X2) \wedge ((v2\_cat\_1 X2) \wedge ((v3\_cat\_1 \\
& X2) \wedge ((v4\_cat\_1 X2) \wedge ((v5\_cat\_1 X2) \wedge ((v6\_cat\_1 X2) \wedge (l1\_cat\_1 \\
& X2))))))) \Rightarrow (\forall X3.(m2\_cat\_1 X3 X0 X1) \Rightarrow (\forall X4.(m2\_cat\_1 \\
& X4 X0 X2) \Rightarrow (\forall X5.(m1\_subset\_1 X5 (u1\_struct\_0 X0) \Rightarrow (k8\_cat\_1 \\
& X0 (k8\_cat\_2 X1 X2) (k8\_isocat\_2 X0 X1 X2 X3 X4) X5 = k9\_cat\_2 X1 X2 ( \\
& k8\_cat\_1 X0 X1 X3 X5) (k8\_cat\_1 X0 X2 X4 X5))))))
\end{aligned}$$