

## t5\_yellow18

(TMXhiQkwPbKv2hPy8inCY1ZDx3PCwvfdaek)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v11\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v12\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $l2\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $r1\_functor0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_yellow18 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v15\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v21\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k15\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_altcat\_2 : \iota \Rightarrow o$  be given. Let  $v8\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k13\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k12\_functor0 : \iota \Rightarrow \iota$  be given. Let  $g2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_functor3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_functor3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $v9\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v12\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
 & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\
 & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((v15\_functor0 \\
 & X2 X0 X1) \wedge (m2\_functor0 X2 X0 X1)) \Rightarrow (\neg (v21\_functor0 X2 X0 X1) \wedge (\forall X3. \\
 & (m2\_functor0 X3 X1 X0) \Rightarrow (\neg (X3 = k15\_functor0 X0 X1 X2) \wedge ((v21\_functor0 \\
 & X3 X1 X0) \wedge (v15\_functor0 X3 X1 X0))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
 & X0) \wedge ((v1\_altcat\_2 X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg \\
 & v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge ((v1\_altcat\_2 \\
 & X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((v8\_functor0 X2 X0 X1) \wedge \\
 & (l2\_functor0 X2 X0 X1)) \Rightarrow ((v21\_functor0 X2 X0 X1) \Rightarrow (k13\_functor0 \\
 & X0 X1 X0 X2 (k15\_functor0 X0 X1 X2) = k12\_functor0 X0))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
& \quad X0) \wedge ((v1\_altcat\_2 X0) \wedge (l2\_altcat\_1 X0)))))) \Rightarrow (\forall X1.((\neg \\
& v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge ((v1\_altcat\_2 \\
& \quad X1) \wedge (l2\_altcat\_1 X1)))))) \Rightarrow (\forall X2.((v8\_functor0 X2 X0 X1) \wedge \\
& (l2\_functor0 X2 X0 X1)) \Rightarrow ((v21\_functor0 X2 X0 X1) \Rightarrow (\forall X3.( \\
& (v8\_functor0 X3 X1 X0) \wedge (l2\_functor0 X3 X1 X0)) \Rightarrow ((g2\_functor0 X1 \\
& X0 (u1\_functor0 X1 X0 X3) (u2\_functor0 X1 X0 X3) = k15\_functor0 X0 \\
& X1 X2) \Rightarrow (k13\_functor0 X1 X0 X1 X3 X2 = k12\_functor0 X1))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2\_struct\_0 \\
& X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge \\
& (l2\_altcat\_1 X0)))))) \wedge (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge \\
& ((v11\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))))) \wedge \\
& (((v15\_functor0 X2 X0 X1) \wedge (m2\_functor0 X2 X0 X1)) \wedge ((v15\_functor0 \\
& X3 X0 X1) \wedge (m2\_functor0 X3 X0 X1)))) \Rightarrow (r1\_functor3 X0 X1 X2 X2)
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((\neg v2\_struct\_0 \\
& X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\
& (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge \\
& (l2\_altcat\_1 X1)))))) \wedge (((\neg v2\_struct\_0 X2) \wedge ((v12\_altcat\_1 X2) \wedge \\
& (l2\_altcat\_1 X2)))) \wedge (((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 \\
& X0 X1)) \wedge ((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)))) \Rightarrow ( \\
& k1\_functor3 X0 X1 X2 X3 X4 = k13\_functor0 X0 X1 X2 X3 X4)
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\
& ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\
& ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\
& X2 X0 X1) \Rightarrow (l2\_functor0 X2 X0 X1))
\end{aligned} \tag{6}$$

Assume the following.

$$\forall X0. (l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge (l1\_altcat\_1 \\
& X0)) \wedge (((\neg v2\_struct\_0 X1) \wedge (l1\_altcat\_1 X1)) \wedge (l2\_functor0 X2 \\
& X0 X1))) \Rightarrow ((v9\_functor0 (k15\_functor0 X0 X1 X2) X1 X0) \wedge (l2\_functor0 \\
& (k15\_functor0 X0 X1 X2) X1 X0))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow ((v9\_functor0 (k12\_functor0 X0) X0 X0) \wedge \\ ((v15\_functor0 (k12\_functor0 X0) X0 X0) \wedge (m2\_functor0 (k12\_functor0 \\ X0) X0 X0))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow ((r1\_functor0 X0 \\ X1) \Leftrightarrow (\exists X2.(m2\_functor0 X2 X0 X1) \wedge ((v21\_functor0 X2 X0 X1) \wedge \\ (v15\_functor0 X2 X0 X1)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 \\ X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v11\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))))) \Rightarrow ((r1\_yellow18 X0 X1) \Leftrightarrow (\exists X2.((v15\_functor0 X2 X0 X1) \wedge (m2\_functor0 X2 X0 X1)) \wedge (\exists X3.((v15\_functor0 X3 X1 X0) \wedge (m2\_functor0 X3 X1 X0)) \wedge ((r1\_functor3 X0 X0 (k1\_functor3 X0 X1 X0 X2 X3) (k12\_functor0 X0)) \wedge (r1\_functor3 X1 X1 (k1\_functor3 X1 X0 X1 X3 X2) (k12\_functor0 X1))))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\ ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\ ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\ X2 X0 X1) \Rightarrow ((v8\_functor0 X2 X0 X1) \wedge (v12\_functor0 X2 X0 X1))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.(l2\_altcat\_1 X0) \Rightarrow (((\neg v2\_struct\_0 X0) \wedge (v12\_altcat\_1 \\ X0)) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge (v1\_altcat\_2 X0))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. \forall X2.((l1\_altcat\_1 X0) \wedge ((l1\_altcat\_1 \\ X1) \wedge (l2\_functor0 X2 X0 X1))) \Rightarrow ((v9\_functor0 X2 X0 X1) \Rightarrow (X2 = g2\_functor0 \\ X0 X1 (u1\_functor0 X0 X1 X2) (u2\_functor0 X0 X1 X2))) \end{aligned} \quad (14)$$

**Theorem 1**

$$\begin{aligned} \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v11\_altcat\_1 \\ X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))))) \Rightarrow (\forall X1. (( \\ \neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v11\_altcat\_1 X1) \wedge ((v12\_altcat\_1 \\ X1) \wedge (l2\_altcat\_1 X1)))))) \Rightarrow ((r1\_functor0 X0 X1) \Rightarrow (r1\_yellow18 \\ X0 X1))) \end{aligned}$$