

# l46\_oppcat\_1

(TMJhgeEcsWksU7aEuTMh3k6w1cgCJ3dLjHP)

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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  $m2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_oppcat\_1 : \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k9\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_graph\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_graph\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $g1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_cat\_1 : \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $l1\_graph\_1 : \iota \Rightarrow o$  be given. Let  $u2\_graph\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_graph\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_cat\_1 : \iota \Rightarrow \iota$  be given. Let  $k1\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge (( \\
& \neg v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\
& X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\
& (m2\_cat\_1 X2 X0 X1) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u4\_struct\_0 X0)) \Rightarrow \\
& (\forall X4.(m1\_subset\_1 X4 (u4\_struct\_0 X0)) \Rightarrow ((k3\_graph\_1 X0 \\
& X4 = k4\_graph\_1 X0 X3) \Rightarrow ((k3\_graph\_1 X1 (k3\_funct\_2 (u4\_struct\_0 \\
& X0) (u4\_struct\_0 X1) X2 X4) = k4\_graph\_1 X1 (k3\_funct\_2 (u4\_struct\_0 \\
& X0) (u4\_struct\_0 X1) X2 X3) \wedge (k3\_funct\_2 (u4\_struct\_0 X0) (u4\_struct\_0 \\
& X1) X2 (k1\_cat\_1 X0 X3 X4) = k1\_cat\_1 X1 (k3\_funct\_2 (u4\_struct\_0 \\
& X0) (u4\_struct\_0 X1) X2 X3) (k3\_funct\_2 (u4\_struct\_0 X0) (u4\_struct\_0 \\
& X1) X2 X4)))))))))
\end{aligned}
\tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_cat\_1 \\ & X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3.(m1\_cat\_1 X3 X0 \\ & X1 X2) \Rightarrow ((k2\_cat\_1 X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow ((k3\_graph\_1 X0 X3 = X1) \wedge \\ & (k4\_graph\_1 X0 X3 = X2)))))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. \\ & (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\neg(k2\_cat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge \\ & ((k2\_cat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge (\neg \forall X4.(m1\_cat\_1 X4 X0 \\ & X1 X2) \Rightarrow (\forall X5.(m1\_cat\_1 X5 X0 X2 X3) \Rightarrow (k5\_oppcat\_1 X0 (k1\_cat\_1 \\ & X0 X4 X5) = k1\_cat\_1 (k2\_oppcat\_1 X0) (k7\_oppcat\_1 X0 X2 X3 X5) (k7\_oppcat\_1 \\ & X0 X1 X2 X4)))))))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((v1\_funct\_1 \\ & X2) \wedge ((v1\_funct\_2 X2 X1 X0) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & X1 X0)))))) \wedge (((v1\_funct\_1 X3) \wedge ((v1\_funct\_2 X3 X1 X0) \wedge (m1\_subset\_1 \\ & X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0)))))) \wedge ((v1\_funct\_1 X4) \wedge (m1\_subset\_1 \\ & X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X1 X1) X1)))))) \Rightarrow (\forall X5. \\ & \forall X6. \forall X7. \forall X8. \forall X9. (g1\_cat\_1 X0 X1 X2 \\ & X3 X4 = g1\_cat\_1 X5 X6 X7 X8 X9) \Rightarrow ((X0 = X5) \wedge ((X1 = X6) \wedge ((X2 = X7) \wedge ((X3 = \\ & X8) \wedge (X4 = X9)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0)))))))) \Rightarrow ((\neg v2\_struct\_0 (k2\_oppcat\_1 X0)) \wedge \\ & ((\neg v11\_struct\_0 (k2\_oppcat\_1 X0)) \wedge ((v1\_cat\_1 (k2\_oppcat\_1 X0)) \wedge \\ & ((v2\_cat\_1 (k2\_oppcat\_1 X0)) \wedge ((v3\_cat\_1 (k2\_oppcat\_1 X0)) \wedge \\ & (v4\_cat\_1 (k2\_oppcat\_1 X0)) \wedge ((v5\_cat\_1 (k2\_oppcat\_1 X0)) \wedge (v6\_cat\_1 \\ & (k2\_oppcat\_1 X0)))))))))) \end{aligned} \quad (5)$$

Assume the following.

$$\forall X0.((\neg v11\_struct\_0 X0) \wedge (l5\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u4\_struct\_0 X0)) \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_graph\_1 X0) \Rightarrow & ((v1\_funct\_1 (u2\_graph\_1 X0)) \wedge (( \\ & v1\_funct\_2 (u2\_graph\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge \\ & (m1\_subset\_1 (u2\_graph\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ & X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_graph\_1 X0) \Rightarrow & ((v1\_funct\_1 (u1\_graph\_1 X0)) \wedge (( \\ & v1\_funct\_2 (u1\_graph\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge \\ & (m1\_subset\_1 (u1\_graph\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ & X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_cat\_1 X0) \Rightarrow & ((v1\_funct\_1 (u1\_cat\_1 X0)) \wedge (m1\_subset\_1 \\ & (u1\_cat\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ & X0) (u4\_struct\_0 X0)) (u4\_struct\_0 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge \\ & ((v2\_cat\_1 X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge \\ & ((v6\_cat\_1 X0) \wedge (l1\_cat\_1 X0)))))))))) \wedge ((\neg v2\_struct\_0 X1) \wedge ((\neg \\ & v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 X1) \wedge \\ & ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1)))))))))) \Rightarrow (\forall X2. \\ & (m2\_cat\_1 X2 X0 X1) \Rightarrow ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 (u4\_struct\_0 \\ & X0) (u4\_struct\_0 X1)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (u4\_struct\_0 X0) (u4\_struct\_0 X1))))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 \\ & X0) \wedge (l1\_cat\_1 X0))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)))) \Rightarrow (\forall X3.(m1\_cat\_1 X3 X0 X1 X2) \Rightarrow (m1\_subset\_1 \\ & X3 (u4\_struct\_0 X0))) \end{aligned} \quad (11)$$

Assume the following.

$$\forall X0.(l1\_graph\_1 X0) \Rightarrow (l5\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\forall X0.(l1\_cat\_1 X0) \Rightarrow (l1\_graph\_1 X0) \quad (13)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 \\
& X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 \\
& X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge(((\neg v2\_struct\_0 X1)\wedge \\
& ((\neg v11\_struct\_0 X1)\wedge((v2\_cat\_1 X1)\wedge((v3\_cat\_1 X1)\wedge((v4\_cat\_1 \\
& X1)\wedge((v5\_cat\_1 X1)\wedge((v6\_cat\_1 X1)\wedge(l1\_cat\_1 X1))))))))\wedge((v1\_funct\_1 \\
& X2)\wedge((v1\_funct\_2 X2 (u4\_struct\_0 (k2\_oppcat\_1 X0)) (u4\_struct\_0 \\
& X1))\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\
& (k2\_oppcat\_1 X0)) (u4\_struct\_0 X1))))))\Rightarrow((v1\_funct\_1 (k9\_oppcat\_1 \\
& X0 X1 X2))\wedge((v1\_funct\_2 (k9\_oppcat\_1 X0 X1 X2) (u4\_struct\_0 X0) \\
& (u4\_struct\_0 X1))\wedge(m1\_subset\_1 (k9\_oppcat\_1 X0 X1 X2) (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 (u4\_struct\_0 X0) (u4\_struct\_0 X1))))))
\end{aligned} \tag{14}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge \\
& ((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge \\
& ((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge(m1\_subset\_1 X1 (u4\_struct\_0 \\
& X0))\Rightarrow(m1\_subset\_1 (k5\_oppcat\_1 X0 X1) (u4\_struct\_0 (k2\_oppcat\_1 \\
& X0)))
\end{aligned} \tag{15}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 \\
& X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 \\
& X0)\wedge(l1\_cat\_1 X0))))))))\Rightarrow((\neg v2\_struct\_0 (k2\_oppcat\_1 X0))\wedge \\
& ((\neg v11\_struct\_0 (k2\_oppcat\_1 X0))\wedge((v1\_cat\_1 (k2\_oppcat\_1 X0))\wedge \\
& (l1\_cat\_1 (k2\_oppcat\_1 X0))))
\end{aligned} \tag{16}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X0)\wedge \\
& ((\neg v1\_xboole\_0 X1)\wedge((\neg v1\_xboole\_0 X2)\wedge((v1\_funct\_1 X3)\wedge(m1\_subset\_1 \\
& X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1) X2))))))\Rightarrow(( \\
& v1\_funct\_1 (k1\_oppcat\_1 X0 X1 X2 X3))\wedge(m1\_subset\_1 (k1\_oppcat\_1 \\
& X0 X1 X2 X3) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0) X2))))
\end{aligned} \tag{17}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.((l1\_cat\_1 X0)\wedge((m1\_subset\_1 \\
& X1 (u4\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u4\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 \\
& (k1\_cat\_1 X0 X1 X2) (u4\_struct\_0 X0))
\end{aligned} \tag{18}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((\neg \\
& v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\
& X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\
& ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 (u4\_struct\_0 (k2\_oppcat\_1 X0)) \\
& (u4\_struct\_0 X1)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\
& (u4\_struct\_0 (k2\_oppcat\_1 X0)) (u4\_struct\_0 X1)))))) \Rightarrow (\forall X3. \\
& ((v1\_funct\_1 X3) \wedge ((v1\_funct\_2 X3 (u4\_struct\_0 X0) (u4\_struct\_0 \\
& X1)) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\
& X0) (u4\_struct\_0 X1)))))) \Rightarrow ((X3 = k9\_oppcat\_1 X0 X1 X2) \Leftrightarrow (\forall X4. \\
& (m1\_subset\_1 X4 (u4\_struct\_0 X0)) \Rightarrow (k3\_funct\_2 (u4\_struct\_0 X0) \\
& (u4\_struct\_0 X1) X3 X4 = k3\_funct\_2 (u4\_struct\_0 (k2\_oppcat\_1 X0)) \\
& (u4\_struct\_0 X1) X2 (k5\_oppcat\_1 X0 X4))))))
\end{aligned} \tag{19}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\
& X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((k2\_cat\_1 \\
& X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow (\forall X3.(m1\_cat\_1 X3 X0 X1 X2) \Rightarrow (k7\_oppcat\_1 \\
& X0 X1 X2 X3 = X3))))))
\end{aligned} \tag{20}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 \\
& X0)) \Rightarrow (k5\_oppcat\_1 X0 X1 = X1))
\end{aligned} \tag{21}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_graph\_1 \\
& X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (k4\_graph\_1 \\
& X0 X1 = k3\_funct\_2 (u4\_struct\_0 X0) (u1\_struct\_0 X0) (u2\_graph\_1 \\
& X0) X1))
\end{aligned} \tag{22}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge (l1\_graph\_1 \\
& X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u4\_struct\_0 X0)) \Rightarrow (k3\_graph\_1 \\
& X0 X1 = k3\_funct\_2 (u4\_struct\_0 X0) (u1\_struct\_0 X0) (u1\_graph\_1 \\
& X0) X1))
\end{aligned} \tag{23}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (k2\_oppcat\_1 X0 = g1\_cat\_1 (u1\_struct\_0 \\ & X0) (u4\_struct\_0 X0) (u2\_graph\_1 X0) (u1\_graph\_1 X0) (k1\_oppcat\_1 \\ & (u4\_struct\_0 X0) (u4\_struct\_0 X0) (u4\_struct\_0 X0) (u1\_cat\_1 X0))) \end{aligned} \quad (24)$$

Assume the following.

$$\begin{aligned} & \forall X0.(l1\_cat\_1 X0) \Rightarrow ((v1\_cat\_1 X0) \Rightarrow (X0 = g1\_cat\_1 (u1\_struct\_0 \\ & X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) (u1\_cat\_1 \\ & X0))) \end{aligned} \quad (25)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ & X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ & X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge (( \\ & \neg v11\_struct\_0 X1) \wedge ((v2\_cat\_1 X1) \wedge ((v3\_cat\_1 X1) \wedge ((v4\_cat\_1 \\ & X1) \wedge ((v5\_cat\_1 X1) \wedge ((v6\_cat\_1 X1) \wedge (l1\_cat\_1 X1))))))) \Rightarrow (\forall X2. \\ & (m2\_cat\_1 X2 (k2\_oppcat\_1 X0) X1) \Rightarrow (\forall X3.(m1\_subset\_1 X3 \\ & (u1\_struct\_0 X0)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X0)) \Rightarrow \\ & (\forall X5.(m1\_subset\_1 X5 (u1\_struct\_0 X0)) \Rightarrow (\neg (k2\_cat\_1 X0 \\ & X3 X4 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1 X0 X4 X5 \neq k1\_xboole\_0) \wedge (\neg \forall X6. \\ & (m1\_cat\_1 X6 X0 X3 X4) \Rightarrow (\forall X7.(m1\_cat\_1 X7 X0 X4 X5) \Rightarrow (k3\_funct\_2 \\ & (u4\_struct\_0 X0) (u4\_struct\_0 X1) (k9\_oppcat\_1 X0 X1 X2) (k1\_cat\_1 \\ & X0 X6 X7) = k1\_cat\_1 X1 (k3\_funct\_2 (u4\_struct\_0 X0) (u4\_struct\_0 \\ & X1) (k9\_oppcat\_1 X0 X1 X2) X7) (k3\_funct\_2 (u4\_struct\_0 X0) (u4\_struct\_0 \\ & X1) (k9\_oppcat\_1 X0 X1 X2) X6)))))))))) \end{aligned}$$