

l66_oppcat_1 (TMW- DAYWG3C1oDVDrCCyxt6p6kVNDGPaDnR)

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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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ 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 $k2_oppcat_1 : \iota \Rightarrow \iota$ be given. Let $k11_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5_oppcat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
 & v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
 & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
 & (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
 & (\forall X4.(m1_subset_1 X4 (u1_struct_0 X1)) \Rightarrow ((k3_funct_2 (\\
 & u4_struct_0 X0) (u4_struct_0 X1) X2 (k4_cat_1 X0 X3) = k4_cat_1 X1 \\
 & X4) \Rightarrow (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 X0 \\
 & X1 X2) X3 = X4))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\neg \\
 & v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
 & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
 & (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\
 & (\exists X4.(m1_subset_1 X4 (u1_struct_0 X1)) \wedge (k3_funct_2 (u4_struct_0 \\
 & X0) (u4_struct_0 X1) X2 (k4_cat_1 X0 X3) = k4_cat_1 X1 X4))))))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (k4_cat_1 X0 X1 = k4_cat_1 (k2_oppcat_1 X0) (k3_oppcat_1 X0 \\ & X1))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge ((\neg v2_struct_0 X1) \wedge ((\neg \\ & v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 X1) \wedge \\ & ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \Rightarrow (\forall X2. \\ & (m2_cat_1 X2 X0 X1) \Rightarrow ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 \\ & X0) (u4_struct_0 X1)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & (u4_struct_0 X0) (u4_struct_0 X1))))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3.(m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\ & X3 (u4_struct_0 X0))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\ & X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0))))))) \wedge (((\neg v2_struct_0 X1) \wedge \\ & ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))))) \wedge ((v1_funct_1 \\ & X2) \wedge ((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 X1)) \wedge (m1_subset_1 \\ & X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X1))))))) \Rightarrow \\ & ((v1_funct_1 (k11_oppcat_1 X0 X1 X2)) \wedge ((v1_funct_2 (k11_oppcat_1 \\ & X0 X1 X2) (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 X1))) \wedge (m1_subset_1 \\ & (k11_oppcat_1 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ & X0) (u4_struct_0 (k2_oppcat_1 X1))))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ X0)) \Rightarrow (k5_oppcat_1 X0 X1 = X1)) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 \\ X1)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\ X0) (u4_struct_0 X1)))))) \Rightarrow (\forall X3.((v1_funct_1 X3) \wedge ((v1_funct_2 \\ X3 (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 X1))) \wedge (m1_subset_1 \\ X3 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 \\ X1)))))) \Rightarrow ((X3 = k11_oppcat_1 X0 X1 X2) \Leftrightarrow (\forall X4.(m1_subset_1 \\ X4 (u4_struct_0 X0)) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\ (k2_oppcat_1 X1)) X3 X4 = k5_oppcat_1 X1 (k3_funct_2 (u4_struct_0 \\ X0) (u4_struct_0 X1) X2 X4)))))) \end{aligned} \quad (9)$$

Theorem 1

$$\begin{aligned} \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u1_struct_0 X0)) \Rightarrow \\ (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 (k2_oppcat_1 X1)) (\\ k11_oppcat_1 X0 X1 X2) (k4_cat_1 X0 X3) = k4_cat_1 (k2_oppcat_1 X1) \\ (k3_oppcat_1 X1 (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) \\ (k7_cat_1 X0 X1 X2) X3)))))) \end{aligned}$$