

t17_cat_3 (TMYWyZEqxE-
GyYv5siTCr2tXoiHYitfUwwKJ)

October 27, 2020

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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ 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 $r2_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k3_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7_cat_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k7_partfun1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_funcop_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k2_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (\neg v1_xboole_0 X2) \Rightarrow (\forall X3. \\ & (m1_subset_1 X3 X2) \Rightarrow ((X1 \in X0) \Rightarrow (k7_partfun1 X2 (k8_funcop_1 X2 \\ & X0 X3) X1 = X3))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (\neg v1_xboole_0 X1) \Rightarrow (\forall X2. ((v1_funct_1 \\ & X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X0 X1)))))) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X0 X1) \wedge \\ & (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow ((\forall X4. \\ & (X4 \in X0) \Rightarrow (k7_partfun1 X1 X2 X4 = k7_partfun1 X1 X3 X4)) \Rightarrow (r2_funct_2 \\ & X0 X1 X2 X3))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 \\ & X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u4_struct_0 X0)) \Rightarrow ((k3_graph_1 \\ & X0 X2 = k4_graph_1 X0 X1) \Rightarrow ((k3_graph_1 X0 (k1_cat_1 X0 X1 X2) = k3_graph_1 \\ & X0 X1) \wedge (k4_graph_1 X0 (k1_cat_1 X0 X1 X2) = k4_graph_1 X0 X2)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((v1_funct_1 X2) \wedge \\ & ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\ & X0 X1)))))) \wedge ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X0 X1) \wedge (m1_subset_1 \\ & X3 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow ((r2_funct_2 X0 X1 X2 \\ & X3) \Leftrightarrow (X2 = X3)) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. ((\neg v1_xboole_0 X0) \wedge (m1_subset_1 X2 X0)) \Rightarrow (k8_funcop_1 X0 X1 X2 = k2_funcop_1 X1 X2) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (k4_graph_1 \\ & X0 X1 = k2_graph_1 X0 X1) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & (l1_graph_1 X0))) \wedge (m1_subset_1 X1 (u4_struct_0 X0))) \Rightarrow (k3_graph_1 \\ & X0 X1 = k1_graph_1 X0 X1) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0. ((\neg v2_struct_0 X0) \wedge (l1_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u1_struct_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0. (l5_struct_0 X0) \Rightarrow (l1_struct_0 X0) \quad (9)$$

Assume the following.

$$\forall X0. (l1_graph_1 X0) \Rightarrow (l5_struct_0 X0) \quad (10)$$

Assume the following.

$$\forall X0. (l1_cat_1 X0) \Rightarrow (l1_graph_1 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1_xboole_0 X0)\wedge(m1_subset_1 \\ & X2 X0))\Rightarrow((v1_funct_1 (k8_funcop_1 X0 X1 X2))\wedge((v1_funct_2 (k8_funcop_1 \\ & X0 X1 X2) X1 X0)\wedge(m1_subset_1 (k8_funcop_1 X0 X1 X2) (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 X0)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((v1_relat_1 X1)\wedge((v5_relat_1 \\ & X1 X0)\wedge(v1_funct_1 X1)))\Rightarrow(m1_subset_1 (k7_partfun1 X0 X1 X2) X0) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 \\ & X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 \\ & X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge(((\\ & v1_funct_1 X2)\wedge((v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 \\ & X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\wedge(m1_subset_1 \\ & X3 (u4_struct_0 X0)))\Rightarrow((v1_funct_1 (k7_cat_3 X0 X1 X2 X3))\wedge((\\ & v1_funct_2 (k7_cat_3 X0 X1 X2 X3) X1 (u4_struct_0 X0))\wedge(m1_subset_1 \\ & (k7_cat_3 X0 X1 X2 X3) (k1_zfmisc_1 (k2_zfmisc_1 X1 (u4_struct_0 \\ & X0)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & (l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 \\ & (k3_graph_1 X0 X1) (u1_struct_0 X0)) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\ & X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 \\ & X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((v1_funct_1 X2)\wedge(\\ & (v1_funct_2 X2 X1 (u4_struct_0 X0))\wedge(m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X1 (u4_struct_0 X0))))))\Rightarrow((v1_funct_1 (k3_cat_3 \\ & X0 X1 X2))\wedge((v1_funct_2 (k3_cat_3 X0 X1 X2) X1 (u1_struct_0 X0))\wedge \\ & (m1_subset_1 (k3_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 (\\ & u1_struct_0 X0)))))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((l1_graph_1 X0)\wedge(m1_subset_1 X1 (u4_struct_0 \\ & X0)))\Rightarrow(m1_subset_1 (k2_graph_1 X0 X1) (u1_struct_0 X0)) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\
& X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 \\
& X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge ((v1_funct_1 X2) \wedge \\
& (v1_funct_2 X2 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \Rightarrow ((v1_funct_1 (k2_cat_3 \\
& X0 X1 X2)) \wedge ((v1_funct_2 (k2_cat_3 X0 X1 X2) X1 (u1_struct_0 X0)) \wedge \\
& (m1_subset_1 (k2_cat_3 X0 X1 X2) (k1_zfmisc_1 (k2_zfmisc_1 X1 (\\
& u1_struct_0 X0))))))
\end{aligned} \tag{18}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((l1_graph_1 X0) \wedge (m1_subset_1 X1 (u4_struct_0 \\
& X0))) \Rightarrow (m1_subset_1 (k1_graph_1 X0 X1) (u1_struct_0 X0))
\end{aligned} \tag{19}$$

Assume the following.

$$\begin{aligned}
& \forall X0. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. \forall X2. ((v1_funct_1 \\
& X2) \wedge ((v1_funct_2 X2 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \Rightarrow (\forall X3. (m1_subset_1 \\
& X3 (u4_struct_0 X0)) \Rightarrow (\forall X4. ((v1_funct_1 X4) \wedge ((v1_funct_2 \\
& X4 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 \\
& X1 (u4_struct_0 X0)))))) \Rightarrow ((X4 = k7_cat_3 X0 X1 X2 X3) \Leftrightarrow (\forall X5. \\
& (X5 \in X1) \Rightarrow (k7_partfun1 (u4_struct_0 X0) X4 X5 = k1_cat_1 X0 (k7_partfun1 \\
& (u4_struct_0 X0) X2 X5) X3))))))
\end{aligned} \tag{20}$$

Assume the following.

$$\begin{aligned}
& \forall X0. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. \forall X2. ((v1_funct_1 \\
& X2) \wedge ((v1_funct_2 X2 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \Rightarrow (\forall X3. ((v1_funct_1 \\
& X3) \wedge ((v1_funct_2 X3 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \Rightarrow ((X3 = k3_cat_3 X0 X1 X2) \Leftrightarrow \\
& (\forall X4. (X4 \in X1) \Rightarrow (k7_partfun1 (u1_struct_0 X0) X3 X4 = k4_graph_1 \\
& X0 (k7_partfun1 (u4_struct_0 X0) X2 X4))))))
\end{aligned} \tag{21}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. \forall X2. ((v1_funct_1 \\
& X2) \wedge ((v1_funct_2 X2 X1 (u4_struct_0 X0)) \wedge (m1_subset_1 X2 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u4_struct_0 X0)))))) \Rightarrow (\forall X3. ((v1_funct_1 \\
& X3) \wedge ((v1_funct_2 X3 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X1 (u1_struct_0 X0)))))) \Rightarrow ((X3 = k2_cat_3 X0 X1 X2) \Leftrightarrow \\
& (\forall X4. (X4 \in X1) \Rightarrow (k7_partfun1 (u1_struct_0 X0) X3 X4 = k3_graph_1 \\
& X0 (k7_partfun1 (u4_struct_0 X0) X2 X4))))))
\end{aligned} \tag{22}$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1))) \Rightarrow ((v4_relat_1 X2 X0) \wedge (v5_relat_1 X2 X1)) \tag{23}$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1))) \Rightarrow (v1_relat_1 X2) \tag{24}$$

Theorem 1

$$\begin{aligned}
& \forall X0. \forall X1. ((\neg v2_struct_0 X1) \wedge ((\neg v11_struct_0 X1) \wedge \\
& ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge \\
& ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. (m1_subset_1 \\
& X2 (u4_struct_0 X1)) \Rightarrow (\forall X3. ((v1_funct_1 X3) \wedge ((v1_funct_2 \\
& X3 X0 (u4_struct_0 X1)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 \\
& X0 (u4_struct_0 X1)))))) \Rightarrow ((r2_funct_2 X0 (u1_struct_0 X1) (k3_cat_3 \\
& X1 X0 X3) (k8_funcop_1 (u1_struct_0 X1) X0 (k3_graph_1 X1 X2))) \Rightarrow \\
& ((r2_funct_2 X0 (u1_struct_0 X1) (k2_cat_3 X1 X0 (k7_cat_3 X1 X0 \\
& X3 X2)) (k2_cat_3 X1 X0 X3)) \wedge (r2_funct_2 X0 (u1_struct_0 X1) (k3_cat_3 \\
& X1 X0 (k7_cat_3 X1 X0 X3 X2)) (k8_funcop_1 (u1_struct_0 X1) X0 (k4_graph_1 \\
& X1 X2))))))
\end{aligned}$$