

t29_index_1 (TMSLLXsXD-
nWd15gzBCseWadVxdYD2Q3kXBF)

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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 $m5_index_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $u1_graph_1 : \iota \Rightarrow \iota$ be given. Let $u2_graph_1 : \iota \Rightarrow \iota$ be given. Let $u1_cat_1 : \iota \Rightarrow \iota$ be given. Let $k7_isocat_1 : \iota \Rightarrow \iota$ be given. Let $m4_index_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_cat_5 : \iota \Rightarrow o$ be given. Let $m2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k15_index_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m3_cat_2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4_cat_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k10_index_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ 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 $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m3_index_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_cat_1 : \iota \Rightarrow o$ be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m3_cat_2 X1 X0) \Rightarrow (\forall X2. \\ & (m3_cat_2 X2 X1) \Rightarrow (m3_cat_2 X2 X0))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m5_index_1 X1 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\
& X0) (k7_isocat_1 X0)) \Rightarrow (\forall X2.(m4_index_1 X2 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) X1) \Rightarrow (\forall X3. \\
& ((\neg v2_struct_0 X3) \wedge ((\neg v11_struct_0 X3) \wedge ((v2_cat_1 X3) \wedge ((v3_cat_1 \\
& X3) \wedge ((v4_cat_1 X3) \wedge ((v5_cat_1 X3) \wedge ((v6_cat_1 X3) \wedge ((v3_cat_5 \\
& X3) \wedge (l1_cat_1 X3)))))))))) \Rightarrow (\forall X4.(m2_cat_1 X4 X2 X3) \Rightarrow (m4_index_1 \\
& (k4_cat_5 X2 X3 X4) (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 \\
& X0) (u2_graph_1 X0) (k15_index_1 X0 X1 X2 X3 X4))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.(m5_index_1 X1 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\
& X0) (k7_isocat_1 X0)) \Rightarrow (\forall X2.((\neg v2_struct_0 X2) \wedge ((\neg v11_struct_0 \\
& X2) \wedge ((v2_cat_1 X2) \wedge ((v3_cat_1 X2) \wedge ((v4_cat_1 X2) \wedge ((v5_cat_1 \\
& X2) \wedge ((v6_cat_1 X2) \wedge ((v3_cat_5 X2) \wedge (l1_cat_1 X2)))))))))) \Rightarrow ((\\
& m3_cat_2 (k10_index_1 X0 X1) X2) \Leftrightarrow (m4_index_1 X2 (u1_struct_0 X0) \\
& (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) X1)))
\end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2_struct_0 X0) \wedge (l1_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u1_struct_0 X0)) \tag{4}$$

Assume the following.

$$\forall X0.((\neg v11_struct_0 X0) \wedge (l5_struct_0 X0)) \Rightarrow (\neg v1_xboole_0 (u4_struct_0 X0)) \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_graph_1 X0) \Rightarrow ((v1_funct_1 (u2_graph_1 X0)) \wedge ((\\
& v1_funct_2 (u2_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0)) \wedge \\
& (m1_subset_1 (u2_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\
& X0) (u1_struct_0 X0))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l1_graph_1 X0) \Rightarrow ((v1_funct_1 (u1_graph_1 X0)) \wedge ((\\
& v1_funct_2 (u1_graph_1 X0) (u4_struct_0 X0) (u1_struct_0 X0)) \wedge \\
& (m1_subset_1 (u1_graph_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 \\
& X0) (u1_struct_0 X0))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\forall X0.(l1_cat_1 X0) \Rightarrow ((v1_funct_1 (u1_cat_1 X0)) \wedge (m1_subset_1 (u1_cat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X0)) (u4_struct_0 X0)))))) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((\neg v1_xboole_0 X0) \wedge ((\neg v1_xboole_0 X1) \wedge (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (((v1_funct_1 X4) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 X1 X1) X1)))) \wedge ((v1_funct_1 X5) \wedge ((v1_funct_2 X5 X0 X1) \wedge (m1_subset_1 X5 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1))))))))) \Rightarrow (\forall X6.(m5_index_1 X6 X0 X1 X2 X3 X4 X5) \Rightarrow (m3_index_1 X6 X0 X1 X2 X3)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.((\neg v1_xboole_0 X0) \wedge ((\neg v1_xboole_0 X1) \wedge (((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X1 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (((v1_funct_1 X3) \wedge ((v1_funct_2 X3 X1 X0) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 X1 X0)))))) \wedge (m3_index_1 X4 X0 X1 X2 X3)))) \Rightarrow (\forall X5.(m4_index_1 X5 X0 X1 X2 X3 X4) \Rightarrow ((\neg v2_struct_0 X5) \wedge ((\neg v11_struct_0 X5) \wedge ((v2_cat_1 X5) \wedge ((v3_cat_1 X5) \wedge ((v4_cat_1 X5) \wedge ((v5_cat_1 X5) \wedge ((v6_cat_1 X5) \wedge ((v3_cat_5 X5) \wedge (l1_cat_1 X5)))))))))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0.(l5_struct_0 X0) \Rightarrow (l1_struct_0 X0) \quad (11)$$

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.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow ((v1_funct_1 (k7_isocat_1 X0)) \wedge ((v1_funct_2 (k7_isocat_1 X0) (u1_struct_0 X0) (u4_struct_0 X0)) \wedge (m1_subset_1 (k7_isocat_1 X0) (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u4_struct_0 X0)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 \\
& X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 \\
& X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge(((\neg v2_struct_0 X1)\wedge \\
& ((\neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\
& X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\wedge(m2_cat_1 \\
& X2 X0 X1))\Rightarrow((v1_cat_1 (k4_cat_5 X0 X1 X2))\wedge(m3_cat_2 (k4_cat_5 \\
& X0 X1 X2) X1))
\end{aligned} \tag{15}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2_struct_0 \\
& X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 \\
& X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 X0)\wedge(l1_cat_1 X0))))))))\wedge((m5_index_1 \\
& X1 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 \\
& X0) (u1_cat_1 X0) (k7_isocat_1 X0))\wedge(((\neg v2_struct_0 X2)\wedge((\neg v11_struct_0 \\
& X2)\wedge((v2_cat_1 X2)\wedge((v3_cat_1 X2)\wedge((v4_cat_1 X2)\wedge((v5_cat_1 \\
& X2)\wedge((v6_cat_1 X2)\wedge((v3_cat_5 X2)\wedge(l1_cat_1 X2))))))))\wedge((\\
& (\neg v2_struct_0 X3)\wedge((\neg v11_struct_0 X3)\wedge((v2_cat_1 X3)\wedge((v3_cat_1 \\
& X3)\wedge((v4_cat_1 X3)\wedge((v5_cat_1 X3)\wedge((v6_cat_1 X3)\wedge((v3_cat_5 \\
& X3)\wedge(l1_cat_1 X3))))))))\wedge(m2_cat_1 X4 X2 X3)))\Rightarrow(m5_index_1 \\
& (k15_index_1 X0 X1 X2 X3 X4) (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 \\
& X0) (u2_graph_1 X0) (u1_cat_1 X0) (k7_isocat_1 X0))
\end{aligned} \tag{16}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\
& X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\
& X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.(m5_index_1 X1 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) (u1_cat_1 \\
& X0) (k7_isocat_1 X0))\Rightarrow(\forall X2.(m4_index_1 X2 (u1_struct_0 \\
& X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 X0) X1)\Rightarrow(\forall X3. \\
& ((\neg v2_struct_0 X3)\wedge((\neg v11_struct_0 X3)\wedge((v2_cat_1 X3)\wedge((v3_cat_1 \\
& X3)\wedge((v4_cat_1 X3)\wedge((v5_cat_1 X3)\wedge((v6_cat_1 X3)\wedge((v3_cat_5 \\
& X3)\wedge(l1_cat_1 X3))))))))\Rightarrow(\forall X4.(m2_cat_1 X4 X2 X3)\Rightarrow(m4_index_1 \\
& X3 (u1_struct_0 X0) (u4_struct_0 X0) (u1_graph_1 X0) (u2_graph_1 \\
& X0) (k15_index_1 X0 X1 X2 X3 X4))))))
\end{aligned}$$