

t42_nattra_1

(TMPM2RDT4HHeTf4rE9WCcwQaSsqFSaaVjg5)

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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 $v2_nattra_1 : \iota \Rightarrow o$ be given. Let $l1_cat_1 : \iota \Rightarrow o$ be given. Let $m2_cat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1_nattra_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k7_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_finset_1 : \iota \Rightarrow o$ be given. Let $k5_card_1 : \iota \Rightarrow \iota$ be given. Let $np_1 : \iota$ be given. Let $l1_graph_1 : \iota \Rightarrow o$ be given. Let $k1_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l5_struct_0 : \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ 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 $k1_zfmisc_1 : \iota \Rightarrow \iota$ be given. Let $k2_zfmisc_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
 & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
 & X0) \wedge (l1_cat_1 X0))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\
 & \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\
 & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1))))))) \Rightarrow (\forall X2. \\
 & (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 X0)) \Rightarrow \\
 & ((k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X1) (k7_cat_1 X0 X1 \\
 & X2) (k3_graph_1 X0 X3) = k3_graph_1 X1 (k3_funct_2 (u4_struct_0 \\
 & X0) (u4_struct_0 X1) X2 X3)) \wedge (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\
 & X1) (k7_cat_1 X0 X1 X2) (k4_graph_1 X0 X3) = k4_graph_1 X1 (k3_funct_2 \\
 & (u4_struct_0 X0) (u4_struct_0 X1) X2 X3))))))
 \end{aligned}
 \tag{1}$$

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.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow ((k3_graph_1 X0 (k4_cat_1 X0 X1) = X1) \wedge (k4_graph_1 X0 (k4_cat_1 \\ & X0 X1) = X1))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\ & X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u4_struct_0 X0)) \Rightarrow (m1_cat_1 \\ & X1 X0 (k3_graph_1 X0 X1) (k4_graph_1 X0 X1))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow ((v2_nattra_1 X0) \Leftrightarrow ((\forall X1.(m1_subset_1 \\ & X1 (u1_struct_0 X0)) \Rightarrow (\exists X2.(v1_finset_1 X2) \wedge ((X2 = k2_cat_1 \\ & X0 X1 X1) \wedge (k5_card_1 X2 = np_1)))))) \wedge (\forall X1.(m1_subset_1 X1 \\ & (u1_struct_0 X0)) \Rightarrow (\forall X2.(m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow \\ & ((X1 \neq X2) \Rightarrow (k2_cat_1 X0 X1 X2 = k1_xboole_0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((\\ & \neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ & (m2_cat_1 X2 X0 X1) \Rightarrow (\forall X3.(m2_cat_1 X3 X0 X1) \Rightarrow ((\forall X4. \\ & (m1_subset_1 X4 (u1_struct_0 X0)) \Rightarrow (\forall X5.(m1_subset_1 X5 \\ & (u1_struct_0 X0)) \Rightarrow ((k2_cat_1 X0 X4 X5 \neq k1_xboole_0) \Rightarrow (\forall X6. \\ & (m1_cat_1 X6 X0 X4 X5) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (u4_struct_0 \\ & X1) X2 X6 = k3_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) X3 X6)))))) \Rightarrow \\ & (r2_funct_2 (u4_struct_0 X0) (u4_struct_0 X1) X2 X3)))) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0))\Rightarrow(k3_graph_1 X0 X1 = k1_graph_1 X0 X1) \quad (7)$$

Assume the following.

$$\forall X0.((\neg v11_struct_0 X0)\wedge(l5_struct_0 X0))\Rightarrow(\neg v1_xboole_0 (u4_struct_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 X0)\wedge(l1_cat_1 X0))))\wedge((\neg v2_struct_0 X1)\wedge(\neg v11_struct_0 X1)\wedge(v2_cat_1 X1)\wedge(v3_cat_1 X1)\wedge(v4_cat_1 X1)\wedge(v5_cat_1 X1)\wedge(v6_cat_1 X1)\wedge(l1_cat_1 X1))))\Rightarrow(\forall X2.(m2_cat_1 X2 X0 X1)\Rightarrow((v1_funct_1 X2)\wedge((v1_funct_2 X2 (u4_struct_0 X0) (u4_struct_0 X1))\wedge(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (u4_struct_0 X1))))))) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge(l1_cat_1 X0))\wedge((m1_subset_1 X1 (u1_struct_0 X0))\wedge(m1_subset_1 X2 (u1_struct_0 X0))))\Rightarrow(\forall X3.(m1_cat_1 X3 X0 X1 X2)\Rightarrow(m1_subset_1 X3 (u4_struct_0 X0))) \quad (10)$$

Assume the following.

$$\forall X0.(l1_graph_1 X0)\Rightarrow(l5_struct_0 X0) \quad (11)$$

Assume the following.

$$\forall X0.(l1_cat_1 X0)\Rightarrow(l1_graph_1 X0) \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2_struct_0 X0)\wedge(\neg v11_struct_0 X0)\wedge((v2_cat_1 X0)\wedge(v3_cat_1 X0)\wedge(v4_cat_1 X0)\wedge(v5_cat_1 X0)\wedge(v6_cat_1 X0)\wedge(l1_cat_1 X0))))\wedge(((\neg v2_struct_0 X1)\wedge(\neg v11_struct_0 X1)\wedge(v2_cat_1 X1)\wedge(v3_cat_1 X1)\wedge(v4_cat_1 X1)\wedge(v5_cat_1 X1)\wedge(v6_cat_1 X1)\wedge(l1_cat_1 X1))))\wedge((m2_cat_1 X2 X0 X1)\wedge(m1_subset_1 X3 (u1_struct_0 X0)))\Rightarrow(m1_subset_1 (k8_cat_1 X0 X1 X2 X3) (u1_struct_0 X1)) \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge \\ & (l1_graph_1 X0)))\wedge(m1_subset_1 X1 (u4_struct_0 X0)))\Rightarrow(m1_subset_1 \\ & (k3_graph_1 X0 X1) (u1_struct_0 X0)) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1_xboole_0 X0)\wedge \\ & (((v1_funct_1 X2)\wedge((v1_funct_2 X2 X0 X1)\wedge(m1_subset_1 X2 (k1_zfmisc_1 \\ & (k2_zfmisc_1 X0 X1))))\wedge(m1_subset_1 X3 X0)))\Rightarrow(m1_subset_1 (\\ & k3_funct_2 X0 X1 X2 X3) X1) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\\ & \neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\ & X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2. \\ & (m2_cat_1 X2 X0 X1)\Rightarrow(\forall X3.(m2_cat_1 X3 X0 X1)\Rightarrow((r1_nattra_1 \\ & X0 X1 X2 X3)\Leftrightarrow(\forall X4.(m1_subset_1 X4 (u1_struct_0 X0))\Rightarrow(k2_cat_1 \\ & X1 (k8_cat_1 X0 X1 X2 X4) (k8_cat_1 X0 X1 X3 X4)\neq k1_xboole_0)))))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow(\forall X1.((\neg v2_struct_0 X1)\wedge((\\ & \neg v11_struct_0 X1)\wedge((v2_cat_1 X1)\wedge((v3_cat_1 X1)\wedge((v4_cat_1 \\ & X1)\wedge((v5_cat_1 X1)\wedge((v6_cat_1 X1)\wedge(l1_cat_1 X1))))))))\Rightarrow(\forall X2. \\ & (m2_cat_1 X2 X0 X1)\Rightarrow(\forall X3.(m1_subset_1 X3 (u1_struct_0 X0))\Rightarrow \\ & (k8_cat_1 X0 X1 X2 X3 = k3_funct_2 (u1_struct_0 X0) (u1_struct_0 \\ & X1) (k7_cat_1 X0 X1 X2) X3))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.(((\neg v2_struct_0 X0)\wedge((\neg v11_struct_0 X0)\wedge((v2_cat_1 \\ & X0)\wedge((v3_cat_1 X0)\wedge((v4_cat_1 X0)\wedge((v5_cat_1 X0)\wedge((v6_cat_1 \\ & X0)\wedge(l1_cat_1 X0))))))))\Rightarrow((v2_nattra_1 X0)\Leftrightarrow(\forall X1.(m1_subset_1 \\ & X1 (u4_struct_0 X0))\Rightarrow(\exists X2.(m1_subset_1 X2 (u1_struct_0 \\ & X0))\wedge(X1 = k4_cat_1 X0 X2)))) \end{aligned} \quad (18)$$

Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0) \wedge (\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge ((v2_nattr_1 X0) \wedge (l1_cat_1 X0)))))))))) \Rightarrow (\forall X1.((\\ & \neg v2_struct_0 X1) \wedge (\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 \\ & X1) \wedge ((v4_cat_1 X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 \\ & X1)))))))))) \Rightarrow (\forall X2.(m2_cat_1 X2 X1 X0) \Rightarrow (\forall X3.(m2_cat_1 \\ & X3 X1 X0) \Rightarrow ((r1_nattr_1 X1 X0 X2 X3) \Rightarrow (r2_funct_2 (u4_struct_0 X1) \\ & (u4_struct_0 X0) X2 X3)))))) \end{aligned}$$