

180_ens_1 (TM- PaM3HRxJJ5HbbrmppTpWyaBrfRKVfdctt)

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Let $v1_xboole_0 : \iota \Rightarrow o$ be given. 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 $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $r1_tarski : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k16_ens_1 : \iota \Rightarrow \iota$ be given. Let $k11_ens_1 : \iota \Rightarrow \iota$ be given. Let $k2_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $u4_struct_0 : \iota \Rightarrow \iota$ be given. Let $k2_ens_1 : \iota \Rightarrow \iota$ be given. Let $k20_ens_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k18_ens_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_partfun1 : \iota \Rightarrow \iota$ be given. Let $k17_ens_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k19_ens_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_cat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ 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 $k4_graph_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_domain_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k18_ens_1 \\ & X0 X2 (k4_cat_1 X0 X1) = k6_partfun1 (k2_cat_1 X0 X1 X2)))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (\forall X2. (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k17_ens_1 \\ & X0 X1 (k4_cat_1 X0 X2) = k6_partfun1 (k2_cat_1 X0 X1 X2)))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\ & X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\ & X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1. (m1_subset_1 X1 (u1_struct_0 \\ & X0)) \Rightarrow (k4_cat_1 X0 X1 \in k2_cat_1 X0 X1 X1)) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow (k3_graph_1 X0 (k4_cat_1 X0 X1) = X1) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1_xboole_0 X0) \Rightarrow (\forall X1. ((\neg v2_struct_0 X1) \wedge \\ & ((\neg v11_struct_0 X1) \wedge ((v2_cat_1 X1) \wedge ((v3_cat_1 X1) \wedge ((v4_cat_1 \\ & X1) \wedge ((v5_cat_1 X1) \wedge ((v6_cat_1 X1) \wedge (l1_cat_1 X1)))))))) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X1)) \Rightarrow (\forall X3. (m1_subset_1 X3 \\ & (u1_struct_0 X1)) \Rightarrow ((r1_tarski (k16_ens_1 X1) X0) \Rightarrow (\forall X4. \\ & (m1_subset_1 X4 (u1_struct_0 (k11_ens_1 X0)) \Rightarrow ((X4 = k2_cat_1 \\ & X1 X2 X3) \Rightarrow (k3_funct_2 (u4_struct_0 X1) (k2_ens_1 (k16_ens_1 X1)) \\ & (k19_ens_1 X1 X2) (k4_cat_1 X1 X3) = k4_cat_1 (k11_ens_1 X0) X4)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 \\ & X0) \wedge (l1_cat_1 X0))) \wedge ((m1_subset_1 X1 (u1_struct_0 X0)) \wedge (m1_subset_1 \\ & X2 (u1_struct_0 X0)))) \Rightarrow (\forall X3. (m1_cat_1 X3 X0 X1 X2) \Rightarrow (m1_subset_1 \\ & X3 (u4_struct_0 X0))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v5_cat_1 X0) \wedge ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))) \wedge (m1_subset_1 \\ & X1 (u1_struct_0 X0))) \Rightarrow (m1_cat_1 (k4_cat_1 X0 X1) X0 X1 X1) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow ((v1_funct_1 (k20_ens_1 X0 X1)) \wedge ((v1_funct_2 (k20_ens_1 \\ & X0 X1) (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0))) \wedge (m1_subset_1 \\ & (k20_ens_1 X0 X1) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (\\ & k2_ens_1 (k16_ens_1 X0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge \\ & ((v2_cat_1 X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge \\ & ((v6_cat_1 X0) \wedge (l1_cat_1 X0)))))))) \wedge (m1_subset_1 X1 (u1_struct_0 \\ & X0))) \Rightarrow ((v1_funct_1 (k19_ens_1 X0 X1)) \wedge ((v1_funct_2 (k19_ens_1 \\ & X0 X1) (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0))) \wedge (m1_subset_1 \\ & (k19_ens_1 X0 X1) (k1_zfmisc_1 (k2_zfmisc_1 (u4_struct_0 X0) (\\ & k2_ens_1 (k16_ens_1 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge (l1_cat_1 \\
& X0))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 X0)) \Rightarrow (\forall X2. \\
& (m1_subset_1 X2 (u1_struct_0 X0)) \Rightarrow (k2_cat_1 X0 X1 X2 = ReplSep (\\
& toset (\lambda X3 : \iota.m1_subset_1 X3 (u4_struct_0 X0))) (\lambda X3 : \\
& \iota.(k3_graph_1 X0 X3 = X1) \wedge (k4_graph_1 X0 X3 = X2)) (\lambda X3 : \iota. \\
& X3))))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 \\
& X0) (k2_ens_1 (k16_ens_1 X0))) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (\\
& k2_zfmisc_1 (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0)))))) \Rightarrow \\
& ((X2 = k20_ens_1 X0 X1) \Leftrightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 \\
& X0)) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0)) X2 \\
& X3 = k1_domain_1 (k2_zfmisc_1 (k1_zfmisc_1 (u4_struct_0 X0)) (\\
& k1_zfmisc_1 (u4_struct_0 X0))) (k1_zfmisc_1 (k2_zfmisc_1 (k2_cat_1 \\
& X0 (k4_graph_1 X0 X3) X1) (k2_cat_1 X0 (k3_graph_1 X0 X3) X1))) (k1_domain_1 \\
& (k1_zfmisc_1 (u4_struct_0 X0) (k1_zfmisc_1 (u4_struct_0 X0)) \\
& (k2_cat_1 X0 (k4_graph_1 X0 X3) X1) (k2_cat_1 X0 (k3_graph_1 X0 X3) \\
& X1)) (k18_ens_1 X0 X1 X3))))))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((\neg v11_struct_0 X0) \wedge ((v2_cat_1 \\
& X0) \wedge ((v3_cat_1 X0) \wedge ((v4_cat_1 X0) \wedge ((v5_cat_1 X0) \wedge ((v6_cat_1 \\
& X0) \wedge (l1_cat_1 X0)))))))) \Rightarrow (\forall X1.(m1_subset_1 X1 (u1_struct_0 \\
& X0)) \Rightarrow (\forall X2.((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u4_struct_0 \\
& X0) (k2_ens_1 (k16_ens_1 X0))) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (\\
& k2_zfmisc_1 (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0)))))) \Rightarrow \\
& ((X2 = k19_ens_1 X0 X1) \Leftrightarrow (\forall X3.(m1_subset_1 X3 (u4_struct_0 \\
& X0)) \Rightarrow (k3_funct_2 (u4_struct_0 X0) (k2_ens_1 (k16_ens_1 X0)) X2 \\
& X3 = k1_domain_1 (k2_zfmisc_1 (k1_zfmisc_1 (u4_struct_0 X0)) (\\
& k1_zfmisc_1 (u4_struct_0 X0))) (k1_zfmisc_1 (k2_zfmisc_1 (k2_cat_1 \\
& X0 X1 (k3_graph_1 X0 X3)) (k2_cat_1 X0 X1 (k4_graph_1 X0 X3)))) (k1_domain_1 \\
& (k1_zfmisc_1 (u4_struct_0 X0) (k1_zfmisc_1 (u4_struct_0 X0)) \\
& (k2_cat_1 X0 X1 (k3_graph_1 X0 X3)) (k2_cat_1 X0 X1 (k4_graph_1 X0 \\
& X3)) (k17_ens_1 X0 X1 X3))))))
\end{aligned} \tag{12}$$

Theorem 1

$$\begin{aligned} & \forall X0.(\neg v1_xboole_0 X0) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge \\ & ((\neg v11_struct_0 X1) \wedge (v2_cat_1 X1) \wedge (v3_cat_1 X1) \wedge (v4_cat_1 \\ & X1) \wedge (v5_cat_1 X1) \wedge (v6_cat_1 X1) \wedge (l1_cat_1 X1)))))) \Rightarrow (\forall X2. \\ & (m1_subset_1 X2 (u1_struct_0 X1)) \Rightarrow (\forall X3.(m1_subset_1 X3 \\ & (u1_struct_0 X1)) \Rightarrow ((r1_tarski (k16_ens_1 X1) X0) \Rightarrow (\forall X4. \\ & (m1_subset_1 X4 (u1_struct_0 (k11_ens_1 X0))) \Rightarrow ((X4 = k2_cat_1 \\ & X1 X2 X3) \Rightarrow (k3_funct_2 (u4_struct_0 X1) (k2_ens_1 (k16_ens_1 X1)) \\ & (k20_ens_1 X1 X3) (k4_cat_1 X1 X2) = k4_cat_1 (k11_ens_1 X0) X4))))))) \end{aligned}$$