

t40_waybel20 (TM-
RAUHZxD4x5uYLFQK7nZbpu7Bs9Tn6r1hi)

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Let $v3_orders_2 : \iota \Rightarrow o$ be given. Let $v4_orders_2 : \iota \Rightarrow o$ be given. Let $v5_orders_2 : \iota \Rightarrow o$ be given. Let $v1_lattice3 : \iota \Rightarrow o$ be given. Let $v2_lattice3 : \iota \Rightarrow o$ be given. Let $v3_lattice3 : \iota \Rightarrow o$ be given. Let $v3_waybel_3 : \iota \Rightarrow o$ be given. Let $l1_orders_2 : \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_funct_2 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $v22_waybel_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v8_waybel_1 : \iota \Rightarrow \iota \Rightarrow o$ 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 $v1_waybel20 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4_waybel20 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_yellow_3 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v3_relat_2 : \iota \Rightarrow o$ be given. Let $v8_relat_2 : \iota \Rightarrow o$ be given. Let $k8_eqrel_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_waybel20 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_funct_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_eqrel_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1_waybel16 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $k5_yellow_0 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v4_yellow_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v7_yellow_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v4_waybel_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_yellow_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k8_relset_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_waybel20 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_partfun1 : \iota \Rightarrow \iota$ be given. Let $v1_orders_2 : \iota \Rightarrow o$ be given. Let $u1_orders_2 : \iota \Rightarrow \iota$ be given. Let $k1_domain_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r3_orders_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $k16_funct_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8_relat_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4_relat_1 : \iota \Rightarrow \iota$ be given. Let $k15_funct_3 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v5_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Assume the

following.

$$\begin{aligned}
& \forall X0.((v3_orders_2 X0) \wedge ((v4_orders_2 X0) \wedge ((v5_orders_2 \\
& X0) \wedge ((v1_lattice3 X0) \wedge ((v2_lattice3 X0) \wedge ((v3_lattice3 X0) \wedge \\
& ((v3_waybel_3 X0) \wedge (l1_orders_2 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (k1_zfmisc_1 (u1_struct_0 (k3_yellow_3 X0 X0))) \Rightarrow (((v1_partfun1 \\
& X1 (u1_struct_0 X0) \wedge ((v3_relat_2 X1) \wedge ((v8_relat_2 X1) \wedge (m1_subset_1 \\
& X1 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)))))) \Rightarrow \\
& ((\forall X2.((v3_orders_2 X2) \wedge ((v4_orders_2 X2) \wedge ((v5_orders_2 \\
& X2) \wedge ((v1_lattice3 X2) \wedge ((v2_lattice3 X2) \wedge ((v3_lattice3 X2) \wedge \\
& ((v3_waybel_3 X2) \wedge (l1_orders_2 X2)))))) \Rightarrow (\neg(u1_struct_0 X2 = \\
& k8_eqrel_1 (u1_struct_0 X0) (k2_waybel20 X0 X1)) \wedge (\forall X3. \\
& ((v1_funct_1 X3) \wedge ((v1_funct_2 X3 (u1_struct_0 X0) (u1_struct_0 \\
& X2)) \wedge (m1_subset_1 X3 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 \\
& X0) (u1_struct_0 X2)))))) \Rightarrow (\forall X4.(m1_subset_1 X4 (u1_struct_0 \\
& X0)) \Rightarrow (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X2) X3 X4 = k6_eqrel_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0) (k2_waybel20 X0 X1) X4)) \Rightarrow (m1_waybel16 \\
& X3 X0 X2)))) \vee ((\neg v2_struct_0 (k5_yellow_0 (k3_yellow_3 X0 X0) \\
& X1)) \wedge ((v4_yellow_0 (k5_yellow_0 (k3_yellow_3 X0 X0) X1) (k3_yellow_3 \\
& X0 X0)) \wedge ((v7_yellow_0 (k5_yellow_0 (k3_yellow_3 X0 X0) X1) (k3_yellow_3 \\
& X0 X0)) \wedge ((v4_waybel_0 (k5_yellow_0 (k3_yellow_3 X0 X0) X1) (k3_yellow_3 \\
& X0 X0)) \wedge (m1_yellow_0 (k5_yellow_0 (k3_yellow_3 X0 X0) X1) (k3_yellow_3 \\
& X0 X0)))))))))
\end{aligned}$$

(1)

Assume the following.

$$\begin{aligned}
& \forall X0.((v3_orders_2 X0) \wedge ((v4_orders_2 X0) \wedge ((v5_orders_2 \\
& X0) \wedge ((v1_lattice3 X0) \wedge ((v2_lattice3 X0) \wedge ((v3_lattice3 X0) \wedge \\
& ((v3_waybel_3 X0) \wedge (l1_orders_2 X0)))))) \Rightarrow (\forall X1.(m1_subset_1 \\
& X1 (k1_zfmisc_1 (u1_struct_0 (k3_yellow_3 X0 X0))) \Rightarrow (\forall X2. \\
& ((v1_funct_1 X2) \wedge ((v1_funct_2 X2 (u1_struct_0 X0) (u1_struct_0 \\
& X0)) \wedge ((v8_waybel_1 X2 X0) \wedge (m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0)))))) \Rightarrow (\neg(v22_waybel_0 X2 X0 \\
& X0) \wedge ((X1 = k8_relset_1 (u1_struct_0 (k3_yellow_3 X0 X0)) (u1_struct_0 \\
& (k3_yellow_3 X0 X0)) (k1_waybel20 X0 X0 X0 X0 X2 X2) (k6_partfun1 \\
& (u1_struct_0 X0))) \wedge (\forall X3.((v1_orders_2 X3) \wedge ((v3_orders_2 \\
& X3) \wedge ((v4_orders_2 X3) \wedge ((v5_orders_2 X3) \wedge ((v1_lattice3 X3) \wedge \\
& ((v2_lattice3 X3) \wedge ((v3_lattice3 X3) \wedge ((v3_waybel_3 X3) \wedge (l1_orders_2 \\
& X3)))))) \Rightarrow (\neg(u1_struct_0 X3 = k8_eqrel_1 (u1_struct_0 X0) (\\
& k2_waybel20 X0 X1)) \wedge ((u1_orders_2 X3 = ReplSep2 (toset (\lambda X4 : \\
& \iota.m1_subset_1 X4 (u1_struct_0 X0))) (\lambda X4 : \iota.toset (\lambda X5 : \\
& \iota.m1_subset_1 X5 (u1_struct_0 X0))) (\lambda X4 : \iota.\lambda X5 : \iota. \\
& r3_orders_2 X0 (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X0) X2 \\
& X4) (k3_funct_2 (u1_struct_0 X0) (u1_struct_0 X0) X2 X5)) (\lambda X4 : \\
& \iota.\lambda X5 : \iota.k1_domain_1 (k1_zfmisc_1 (u1_struct_0 X0)) (\\
& k1_zfmisc_1 (u1_struct_0 X0)) (k6_eqrel_1 (u1_struct_0 X0) (u1_struct_0 \\
& X0) (k2_waybel20 X0 X1) X4) (k6_eqrel_1 (u1_struct_0 X0) (u1_struct_0 \\
& X0) (k2_waybel20 X0 X1) X5))) \wedge (\forall X4.((v1_funct_1 X4) \wedge ((\\
& v1_funct_2 X4 (u1_struct_0 X0) (u1_struct_0 X3)) \wedge (m1_subset_1 \\
& X4 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X3)))))) \Rightarrow \\
& ((\forall X5.(m1_subset_1 X5 (u1_struct_0 X0)) \Rightarrow (k3_funct_2 (\\
& u1_struct_0 X0) (u1_struct_0 X3) X4 X5 = k6_eqrel_1 (u1_struct_0 \\
& X0) (u1_struct_0 X0) (k2_waybel20 X0 X1) X5)) \Rightarrow (m1_waybel16 X4 X0 \\
& X3)))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(\neg v1_xboole_0 X0) \Rightarrow (\forall X1.(\neg v1_xboole_0 X1) \Rightarrow \\
& (\forall X2.((v1_funct_1 X2) \wedge ((v1_funct_2 X2 X0 X1) \wedge (m1_subset_1 \\
& X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))))) \Rightarrow ((v1_partfun1 (k8_relset_1 \\
& (k2_zfmisc_1 X0 X0) (k2_zfmisc_1 X1 X1) (k16_funct_3 X0 X0 X1 X1 X2 \\
& X2) (k6_partfun1 X1)) X0) \wedge ((v3_relat_2 (k8_relset_1 (k2_zfmisc_1 \\
& X0 X0) (k2_zfmisc_1 X1 X1) (k16_funct_3 X0 X0 X1 X1 X2 X2) (k6_partfun1 \\
& X1))) \wedge ((v8_relat_2 (k8_relset_1 (k2_zfmisc_1 X0 X0) (k2_zfmisc_1 \\
& X1 X1) (k16_funct_3 X0 X0 X1 X1 X2 X2) (k6_partfun1 X1))) \wedge (m1_subset_1 \\
& (k8_relset_1 (k2_zfmisc_1 X0 X0) (k2_zfmisc_1 X1 X1) (k16_funct_3 \\
& X0 X0 X1 X1 X2 X2) (k6_partfun1 X1)) (k1_zfmisc_1 (k2_zfmisc_1 X0 \\
& X0)))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(m1_subset_1 X2 (k1_zfmisc_1 (k2_zfmisc_1 X0 X1)))\Rightarrow(k8_relset_1 X0 X1 X2 X3 = k8_relat_1 X2 X3) \quad (4)$$

Assume the following.

$$\forall X0.k6_partfun1 X0 = k4_relat_1 X0 \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((l1_orders_2 X0)\wedge((l1_orders_2 X1)\wedge((l1_orders_2 X2)\wedge((l1_orders_2 X3)\wedge(((v1_funct_1 X4)\wedge((v1_funct_2 X4 (u1_struct_0 X0) (u1_struct_0 X2))\wedge(m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X2))))))\wedge((v1_funct_1 X5)\wedge((v1_funct_2 X5 (u1_struct_0 X1) (u1_struct_0 X3))\wedge(m1_subset_1 X5 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X1) (u1_struct_0 X3))))))))))\Rightarrow(k1_waybel20 X0 X1 X2 X3 X4 X5 = k15_funct_3 X4 X5) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & (((v1_funct_1 X4)\wedge((v1_funct_2 X4 X0 X2)\wedge(m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 X0 X2))))))\wedge((v1_funct_1 X5)\wedge((v1_funct_2 X5 X1 X3)\wedge(m1_subset_1 X5 (k1_zfmisc_1 (k2_zfmisc_1 X1 X3))))))\Rightarrow(k16_funct_3 X0 X1 X2 X3 X4 X5 = k15_funct_3 X4 X5) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2_struct_0 X0)\wedge((v3_orders_2 X0)\wedge(l1_orders_2 X0)))\Rightarrow(\exists X1.(m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0))))\wedge((\neg v1_xboole_0 X1)\wedge((v1_relat_1 X1)\wedge((v4_relat_1 X1 (u1_struct_0 X0))\wedge((v5_relat_1 X1 (u1_struct_0 X0))\wedge((v1_funct_1 X1)\wedge((v1_partfun1 X1 (u1_struct_0 X0))\wedge((v1_funct_2 X1 (u1_struct_0 X0) (u1_struct_0 X0))\wedge((v22_waybel_0 X1 X0 X0)\wedge(v8_waybel_1 X1 X0)))))))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2_struct_0 X0)\wedge((v3_orders_2 X0)\wedge(l1_orders_2 X0)))\wedge((v1_funct_1 X1)\wedge((v1_funct_2 X1 (u1_struct_0 X0) (u1_struct_0 X0))\wedge((v8_waybel_1 X1 X0)\wedge(m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0))))))))\Rightarrow((\neg v1_xboole_0 (k4_waybel20 X0 X1))\wedge(m1_subset_1 (k4_waybel20 X0 X1) (k1_zfmisc_1 (u1_struct_0 (k3_yellow_3 X0 X0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\
& ((l1_orders_2 X0) \wedge ((l1_orders_2 X1) \wedge ((l1_orders_2 X2) \wedge ((l1_orders_2 \\
& X3) \wedge (((v1_funct_1 X4) \wedge ((v1_funct_2 X4 (u1_struct_0 X0) (u1_struct_0 \\
& X2)) \wedge (m1_subset_1 X4 (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 \\
& X0) (u1_struct_0 X2)))))) \wedge ((v1_funct_1 X5) \wedge ((v1_funct_2 X5 (\\
& u1_struct_0 X1) (u1_struct_0 X3)) \wedge (m1_subset_1 X5 (k1_zfmisc_1 \\
& (k2_zfmisc_1 (u1_struct_0 X1) (u1_struct_0 X3)))))))))) \Rightarrow ((\\
& v1_funct_1 (k1_waybel20 X0 X1 X2 X3 X4 X5)) \wedge ((v1_funct_2 (k1_waybel20 \\
& X0 X1 X2 X3 X4 X5) (u1_struct_0 (k3_yellow_3 X0 X1)) (u1_struct_0 \\
& (k3_yellow_3 X2 X3))) \wedge (m1_subset_1 (k1_waybel20 X0 X1 X2 X3 X4 X5) \\
& (k1_zfmisc_1 (k2_zfmisc_1 (u1_struct_0 (k3_yellow_3 X0 X1)) (\\
& u1_struct_0 (k3_yellow_3 X2 X3))))))
\end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\
& (((v1_funct_1 X4) \wedge ((v1_funct_2 X4 X0 X2) \wedge (m1_subset_1 X4 (k1_zfmisc_1 \\
& (k2_zfmisc_1 X0 X2)))))) \wedge ((v1_funct_1 X5) \wedge ((v1_funct_2 X5 X1 X3) \wedge \\
& (m1_subset_1 X5 (k1_zfmisc_1 (k2_zfmisc_1 X1 X3)))))) \Rightarrow ((v1_funct_1 \\
& (k16_funct_3 X0 X1 X2 X3 X4 X5)) \wedge ((v1_funct_2 (k16_funct_3 X0 X1 \\
& X2 X3 X4 X5) (k2_zfmisc_1 X0 X1) (k2_zfmisc_1 X2 X3)) \wedge (m1_subset_1 \\
& (k16_funct_3 X0 X1 X2 X3 X4 X5) (k1_zfmisc_1 (k2_zfmisc_1 (k2_zfmisc_1 \\
& X0 X1) (k2_zfmisc_1 X2 X3))))))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2_struct_0 X0) \wedge ((v3_orders_2 X0) \wedge (l1_orders_2 \\
& X0))) \Rightarrow (\forall X1. ((v1_funct_1 X1) \wedge ((v1_funct_2 X1 (u1_struct_0 \\
& X0) (u1_struct_0 X0)) \wedge ((v8_waybel_1 X1 X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 \\
& (k2_zfmisc_1 (u1_struct_0 X0) (u1_struct_0 X0)))))) \Rightarrow (k4_waybel20 \\
& X0 X1 = k8_reset_1 (u1_struct_0 (k3_yellow_3 X0 X0)) (u1_struct_0 \\
& (k3_yellow_3 X0 X0)) (k1_waybel20 X0 X0 X0 X0 X1 X1) (k6_partfun1 \\
& (u1_struct_0 X0))))
\end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge (l1_orders_2 X0)) \Rightarrow (\forall X1. \\
& (m1_subset_1 X1 (k1_zfmisc_1 (u1_struct_0 (k3_yellow_3 X0 X0)))) \Rightarrow \\
& ((v1_waybel20 X1 X0) \Leftrightarrow (((v1_partfun1 X1 (u1_struct_0 X0)) \wedge ((v3_relat_2 \\
& X1) \wedge ((v8_relat_2 X1) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0)))))) \wedge ((\neg v2_struct_0 (k5_yellow_0 \\
& (k3_yellow_3 X0 X0) X1)) \wedge ((v4_yellow_0 (k5_yellow_0 (k3_yellow_3 \\
& X0 X0) X1) (k3_yellow_3 X0 X0)) \wedge ((v7_yellow_0 (k5_yellow_0 (k3_yellow_3 \\
& X0 X0) X1) (k3_yellow_3 X0 X0)) \wedge ((v4_waybel_0 (k5_yellow_0 (k3_yellow_3 \\
& X0 X0) X1) (k3_yellow_3 X0 X0)) \wedge (m1_yellow_0 (k5_yellow_0 (k3_yellow_3 \\
& X0 X0) X1) (k3_yellow_3 X0 X0))))))))) \\
& \hspace{15em} (13)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(v1_xboole_0 X0) \Rightarrow (\forall X1.((v1_relat_1 X1) \wedge (v5_relat_1 \\
& X1 X0)) \Rightarrow ((v1_xboole_0 X1) \wedge ((v1_relat_1 X1) \wedge (v5_relat_1 X1 X0)))) \\
& \hspace{15em} (14)
\end{aligned}$$

Assume the following.

$$\forall X0.(l1_orders_2 X0) \Rightarrow ((v2_lattice3 X0) \Rightarrow (\neg v2_struct_0 X0)) \quad (15)$$

Theorem 1

$$\begin{aligned}
& \forall X0.(((v3_orders_2 X0) \wedge ((v4_orders_2 X0) \wedge ((v5_orders_2 \\
& X0) \wedge ((v1_lattice3 X0) \wedge ((v2_lattice3 X0) \wedge ((v3_lattice3 X0) \wedge \\
& ((v3_waybel_3 X0) \wedge (l1_orders_2 X0)))))) \Rightarrow (\forall X1.((v1_funct_1 \\
& X1) \wedge ((v1_funct_2 X1 (u1_struct_0 X0) (u1_struct_0 X0)) \wedge ((v22_waybel_0 \\
& X1 X0 X0) \wedge ((v8_waybel_1 X1 X0) \wedge (m1_subset_1 X1 (k1_zfmisc_1 (k2_zfmisc_1 \\
& (u1_struct_0 X0) (u1_struct_0 X0)))))) \Rightarrow (v1_waybel20 (k4_waybel20 \\
& X0 X1) X0))
\end{aligned}$$