

t11_functor2

(TMWPwpc2RqiZBQFzytER5ZsP76jF4zAbw7n)

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Let $v2_struct_0 : \iota \Rightarrow o$ be given. Let $v2_altcat_1 : \iota \Rightarrow o$ be given. Let $v11_altcat_1 : \iota \Rightarrow o$ be given. Let $v12_altcat_1 : \iota \Rightarrow o$ be given. Let $l2_altcat_1 : \iota \Rightarrow o$ be given. Let $v15_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r8_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1_struct_0 : \iota \Rightarrow \iota$ be given. Let $k5_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $r1_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k3_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1_xboole_0 : \iota \Rightarrow o$ be given. Let $v1_relat_1 : \iota \Rightarrow o$ be given. Let $v4_relat_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1_funct_1 : \iota \Rightarrow o$ be given. Let $v1_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1_struct_0 : \iota \Rightarrow o$ be given. Let $l1_altcat_1 : \iota \Rightarrow o$ be given. Let $m1_subset_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1_xboole_0 : \iota$ be given. Let $k5_altcat_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k6_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\begin{aligned}
 & \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\
 & \quad X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.((\neg \\
 & \neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v11_altcat_1 X1) \wedge ((v12_altcat_1 \\
 & \quad X1) \wedge (l2_altcat_1 X1)))))) \Rightarrow (\forall X2.((v15_functor0 X2 X0 X1) \wedge \\
 & \quad (m2_functor0 X2 X0 X1))) \Rightarrow (\forall X3.((v15_functor0 X3 X0 X1) \wedge \\
 & \quad (m2_functor0 X3 X0 X1))) \Rightarrow (\forall X4.((v15_functor0 X4 X0 X1) \wedge (m2_functor0 \\
 & \quad X4 X0 X1))) \Rightarrow (((r2_functor2 X0 X1 X2 X3) \wedge (r2_functor2 X0 X1 X3 X4)) \Rightarrow \\
 & \quad (r2_functor2 X0 X1 X2 X4))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v11_altcat_1 X1) \wedge ((v12_altcat_1 X1) \wedge (l2_altcat_1 X1)))))) \Rightarrow (\forall X2.(m2_functor0 X2 X0 X1) \Rightarrow (\forall X3.(m2_functor0 X3 X0 X1) \Rightarrow (\forall X4.(m2_functor0 X4 X0 X1) \Rightarrow (\forall X5.(m2_functor0 X5 X0 X1) \Rightarrow (((r1_functor2 X0 X1 X2 X3) \wedge ((r1_functor2 X0 X1 X3 X4) \wedge (r1_functor2 X0 X1 X4 X5)))) \Rightarrow (\forall X6.(m1_functor2 X6 X0 X1 X2 X3) \Rightarrow (\forall X7.(m1_functor2 X7 X0 X1 X3 X4) \Rightarrow (\forall X8.(m1_functor2 X8 X0 X1 X4 X5) \Rightarrow (r8_pboole (u1_struct_0 X0) (k3_functor2 X0 X1 X2 X3 X5 X6) (k3_functor2 X0 X1 X3 X4 X5 X7 X8) (k3_functor2 X0 X1 X2 X4 X5) (k3_functor2 X0 X1 X2 X3 X4 X6 X7) X8))))))))))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. ((\neg v1_xboole_0 X0) \wedge (((v1_relat_1 X1) \wedge ((v4_relat_1 X1 X0) \wedge ((v1_funct_1 X1) \wedge (v1_partfun1 X1 X0)))) \wedge ((v1_relat_1 X2) \wedge ((v4_relat_1 X2 X0) \wedge ((v1_funct_1 X2) \wedge (v1_partfun1 X2 X0)))))) \Rightarrow ((r8_pboole X0 X1 X2) \Leftrightarrow (X1 = X2))
\end{aligned} \tag{3}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))) \wedge (((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v12_altcat_1 X1) \wedge (l2_altcat_1 X1)))) \wedge ((v15_functor0 X2 X0 X1) \wedge (m2_functor0 X2 X0 X1)) \wedge ((v15_functor0 X3 X0 X1) \wedge (m2_functor0 X3 X0 X1)))) \Rightarrow (\forall X4. (m2_functor2 X4 X0 X1 X2 X3) \Rightarrow (m1_functor2 X4 X0 X1 X2 X3))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))) \wedge (((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v12_altcat_1 X1) \wedge (l2_altcat_1 X1)))) \wedge ((m2_functor0 X2 X0 X1) \wedge (m2_functor0 X3 X0 X1)))) \Rightarrow (\forall X4. (m1_functor2 X4 X0 X1 X2 X3) \Rightarrow ((v1_relat_1 X4) \wedge ((v4_relat_1 X4 (u1_struct_0 X0)) \wedge ((v1_funct_1 X4) \wedge (v1_partfun1 X4 (u1_struct_0 X0))))))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned}
& \forall X0. (l2_altcat_1 X0) \Rightarrow (l1_altcat_1 X0)
\end{aligned} \tag{7}$$

Assume the following.

$$\forall X0.(l1_altcat_1 X0) \Rightarrow (l1_struct_0 X0) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & \forall X6. (((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \wedge (((\neg v2_struct_0 \\ & X1) \wedge ((v2_altcat_1 X1) \wedge ((v11_altcat_1 X1) \wedge ((v12_altcat_1 X1) \wedge \\ & (l2_altcat_1 X1)))))) \wedge (((v15_functor0 X2 X0 X1) \wedge (m2_functor0 \\ & X2 X0 X1)) \wedge ((v15_functor0 X3 X0 X1) \wedge (m2_functor0 X3 X0 X1)) \wedge ((\\ & (v15_functor0 X4 X0 X1) \wedge (m2_functor0 X4 X0 X1)) \wedge ((m2_functor2 \\ & X5 X0 X1 X2 X3) \wedge (m2_functor2 X6 X0 X1 X3 X4)))))) \Rightarrow (m2_functor2 (\\ & k5_functor2 X0 X1 X2 X3 X4 X5 X6) X0 X1 X2 X4) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & \forall X6. (((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v12_altcat_1 \\ & X0) \wedge (l2_altcat_1 X0)))))) \wedge (((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 \\ & X1) \wedge ((v12_altcat_1 X1) \wedge (l2_altcat_1 X1)))))) \wedge ((m2_functor0 X2 \\ & X0 X1) \wedge ((m2_functor0 X3 X0 X1) \wedge ((m2_functor0 X4 X0 X1) \wedge ((m1_functor2 \\ & X5 X0 X1 X2 X3) \wedge (m1_functor2 X6 X0 X1 X3 X4)))))) \Rightarrow (m1_functor2 (\\ & k3_functor2 X0 X1 X2 X3 X4 X5 X6) X0 X1 X2 X4) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned} & \forall X0. (((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\ & X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))))) \Rightarrow (\forall X1. ((\\ & \neg v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v11_altcat_1 X1) \wedge ((v12_altcat_1 \\ & X1) \wedge (l2_altcat_1 X1)))))) \Rightarrow (\forall X2. ((v15_functor0 X2 X0 X1) \wedge \\ & (m2_functor0 X2 X0 X1)) \Rightarrow (\forall X3. ((v15_functor0 X3 X0 X1) \wedge (\\ & m2_functor0 X3 X0 X1)) \Rightarrow (\forall X4. ((v15_functor0 X4 X0 X1) \wedge (m2_functor0 \\ & X4 X0 X1)) \Rightarrow (((r2_functor2 X0 X1 X2 X3) \wedge (r2_functor2 X0 X1 X3 X4)) \Rightarrow \\ & (\forall X5. (m2_functor2 X5 X0 X1 X2 X3) \Rightarrow (\forall X6. (m2_functor2 \\ & X6 X0 X1 X3 X4) \Rightarrow (\forall X7. (m2_functor2 X7 X0 X1 X2 X4) \Rightarrow ((X7 = k5_functor2 \\ & X0 X1 X2 X3 X4 X5 X6) \Leftrightarrow (r8_pboole (u1_struct_0 X0) X7 (k3_functor2 \\ & X0 X1 X2 X3 X4 X5 X6)))))))))) \end{aligned} \quad (11)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v12_altcat_1 \\
& X0) \wedge (l2_altcat_1 X0)))) \Rightarrow (\forall X1.((\neg v2_struct_0 X1) \wedge ((v2_altcat_1 \\
& X1) \wedge ((v12_altcat_1 X1) \wedge (l2_altcat_1 X1)))) \Rightarrow (\forall X2.((v15_functor0 \\
& X2 X0 X1) \wedge (m2_functor0 X2 X0 X1)) \Rightarrow (\forall X3.((v15_functor0 X3 \\
& X0 X1) \wedge (m2_functor0 X3 X0 X1)) \Rightarrow ((r2_functor2 X0 X1 X2 X3) \Leftrightarrow ((r1_functor2 \\
& X0 X1 X2 X3) \wedge (\exists X4.(m1_functor2 X4 X0 X1 X2 X3) \wedge (\forall X5. \\
& (m1_subset_1 X5 (u1_struct_0 X0)) \Rightarrow (\forall X6.(m1_subset_1 X6 \\
& (u1_struct_0 X0)) \Rightarrow ((k1_altcat_1 X0 X5 X6 \neq k1_xboole_0) \Rightarrow (\forall X7. \\
& (m1_subset_1 X7 (k1_altcat_1 X0 X5 X6)) \Rightarrow (k5_altcat_1 X1 (k3_functor0 \\
& X0 X1 X2 X5) (k3_functor0 X0 X1 X2 X6) (k3_functor0 X0 X1 X3 X6) (k6_functor0 \\
& X0 X1 X2 X5 X6 X7) (k2_functor2 X0 X1 X2 X3 X4 X6) = k5_altcat_1 X1 (k3_functor0 \\
& X0 X1 X2 X5) (k3_functor0 X0 X1 X3 X5) (k3_functor0 X0 X1 X3 X6) (k2_functor2 \\
& X0 X1 X2 X3 X4 X5) (k6_functor0 X0 X1 X3 X5 X6 X7)))))))))) \\
& \hspace{15em} (12)
\end{aligned}$$

Theorem 1

$$\begin{aligned}
& \forall X0.((\neg v2_struct_0 X0) \wedge ((v2_altcat_1 X0) \wedge ((v11_altcat_1 \\
& X0) \wedge ((v12_altcat_1 X0) \wedge (l2_altcat_1 X0)))) \Rightarrow (\forall X1.((\neg \\
& v2_struct_0 X1) \wedge ((v2_altcat_1 X1) \wedge ((v11_altcat_1 X1) \wedge ((v12_altcat_1 \\
& X1) \wedge (l2_altcat_1 X1)))) \Rightarrow (\forall X2.((v15_functor0 X2 X0 X1) \wedge \\
& (m2_functor0 X2 X0 X1)) \Rightarrow (\forall X3.((v15_functor0 X3 X0 X1) \wedge (\\
& m2_functor0 X3 X0 X1)) \Rightarrow (\forall X4.((v15_functor0 X4 X0 X1) \wedge (m2_functor0 \\
& X4 X0 X1)) \Rightarrow (\forall X5.((v15_functor0 X5 X0 X1) \wedge (m2_functor0 X5 \\
& X0 X1)) \Rightarrow (\forall X6.(m2_functor2 X6 X0 X1 X2 X3) \Rightarrow (\forall X7.(m2_functor2 \\
& X7 X0 X1 X3 X4) \Rightarrow (((r2_functor2 X0 X1 X2 X3) \wedge ((r2_functor2 X0 X1 X3 \\
& X4) \wedge (r2_functor2 X0 X1 X4 X5))) \Rightarrow (\forall X8.(m2_functor2 X8 X0 \\
& X1 X4 X5) \Rightarrow (r8_pboole (u1_struct_0 X0) (k5_functor2 X0 X1 X2 X3 X5 \\
& X6 (k5_functor2 X0 X1 X3 X4 X5 X7 X8)) (k5_functor2 X0 X1 X2 X4 X5 (k5_functor2 \\
& X0 X1 X2 X3 X4 X6 X7) X8))))))))))
\end{aligned}$$