

# t10\_functor3

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_altcat\_1 : \iota \Rightarrow o$  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  $r1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_functor3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_altcat\_2 : \iota \Rightarrow o$  be given. Let  $v6\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v8\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $l1\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v9\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $v10\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v13\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v12\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_altcat\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v1\_altcat\_2 X1) \wedge (l2\_altcat\_1 X1))) \Rightarrow (\forall X2. \\
& ((\neg v2\_struct\_0 X2) \wedge ((v1\_altcat\_2 X2) \wedge (l2\_altcat\_1 X2)))) \Rightarrow (\forall X3. \\
& ((v6\_functor0 X3 X0 X1) \wedge (v8\_functor0 X3 X0 X1) \wedge (l2\_functor0 X3 \\
& X0 X1))) \Rightarrow (\forall X4.(l2\_functor0 X4 X1 X2) \Rightarrow (\forall X5.(m1\_subset\_1 \\
& X5 (u1\_struct\_0 X0) \Rightarrow (k3\_functor0 X0 X2 (k13\_functor0 X0 X1 X2 X3 \\
& X4) X5 = k3\_functor0 X1 X2 X4 (k3\_functor0 X0 X1 X3 X5))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((\neg v2\_struct\_0 \\
& X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\
& (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge \\
& l2\_altcat\_1 X1)))) \wedge (((\neg v2\_struct\_0 X2) \wedge ((v12\_altcat\_1 X2) \wedge \\
& (l2\_altcat\_1 X2)))) \wedge (((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 \\
& X0 X1) \wedge ((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)))))) \Rightarrow ( \\
& k1\_functor3 X0 X1 X2 X3 X4 = k13\_functor0 X0 X1 X2 X3 X4)
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\ & ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\ & ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\ & X2 X0 X1) \Rightarrow (l2\_functor0 X2 X0 X1)) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((l1\_altcat\_1 X0) \wedge (l1\_altcat\_1 X1)) \Rightarrow ( \\ & \forall X2. (l2\_functor0 X2 X0 X1) \Rightarrow (l1\_functor0 X2 X0 X1)) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0. (l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2\_struct\_0 \\ & X0) \wedge (l1\_altcat\_1 X0)) \wedge (((\neg v2\_struct\_0 X1) \wedge (l1\_altcat\_1 X1)) \wedge \\ & ((l1\_functor0 X2 X0 X1) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 X0)))) \Rightarrow \\ & (m1\_subset\_1 (k3\_functor0 X0 X1 X2 X3) (u1\_struct\_0 X1)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((\neg v2\_struct\_0 \\ & X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge ( \\ & l2\_altcat\_1 X1)))) \wedge (((\neg v2\_struct\_0 X2) \wedge ((v12\_altcat\_1 X2) \wedge \\ & (l2\_altcat\_1 X2)))) \wedge (((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 \\ & X0 X1)) \wedge ((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)))) \Rightarrow ( \\ & (v9\_functor0 (k1\_functor3 X0 X1 X2 X3 X4) X0 X2) \wedge ((v15\_functor0 \\ & (k1\_functor3 X0 X1 X2 X3 X4) X0 X2) \wedge (m2\_functor0 (k1\_functor3 X0 \\ & X1 X2 X3 X4) X0 X2))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_altcat\_1 X0) \Rightarrow ((v2\_altcat\_1 X0) \Leftrightarrow (\forall X1. ( \\ & m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 \\ & (u1\_struct\_0 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow \\ & (\neg (k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \wedge ((k1\_altcat\_1 X0 X2 X3 \neq k1\_xboole\_0) \wedge \\ & (k1\_altcat\_1 X0 X1 X3 = k1\_xboole\_0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3. (m2\_functor0 X3 X0 X1) \Rightarrow ((r1\_functor2 X0 X1 \\ & X2 X3) \Leftrightarrow (\forall X4. (m1\_subset\_1 X4 (u1\_struct\_0 X0)) \Rightarrow (k1\_altcat\_1 \\ & X1 (k3\_functor0 X0 X1 X2 X4) (k3\_functor0 X0 X1 X3 X4) \neq k1\_xboole\_0)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_altcat\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge (l1\_altcat\_1 X1)) \Rightarrow (\forall X2.((v10\_functor0 \\
& X2 X0 X1) \wedge (l2\_functor0 X2 X0 X1)) \Rightarrow ((v8\_functor0 X2 X0 X1) \Leftrightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 \\
& (u1\_struct\_0 X0)) \Rightarrow (\neg(k1\_altcat\_1 X0 X3 X4 \neq k1\_xboole\_0) \wedge (k1\_altcat\_1 \\
& X1 (k3\_functor0 X0 X1 X2 X3) (k3\_functor0 X0 X1 X2 X4) = k1\_xboole\_0))))))))) \\
& \hspace{15em} (10)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\
& ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\
& ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\
& X2 X0 X1) \Rightarrow ((v15\_functor0 X2 X0 X1) \Rightarrow (v6\_functor0 X2 X0 X1))) \\
& \hspace{15em} (11)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\
& ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\
& ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\
& X2 X0 X1) \Rightarrow ((v15\_functor0 X2 X0 X1) \Rightarrow ((v10\_functor0 X2 X0 X1) \wedge (v13\_functor0 \\
& X2 X0 X1)))) \\
& \hspace{15em} (12)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(l2\_altcat\_1 X0) \Rightarrow (((\neg v2\_struct\_0 X0) \wedge (v12\_altcat\_1 \\
& X0)) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge (v1\_altcat\_2 X0))) \\
& \hspace{15em} (13)
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\
& ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\
& ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\
& X2 X0 X1) \Rightarrow ((v8\_functor0 X2 X0 X1) \wedge (v12\_functor0 X2 X0 X1))) \\
& \hspace{15em} (14)
\end{aligned}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
& X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\
& X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((\neg \\
& v2\_struct\_0 X2) \wedge ((v2\_altcat\_1 X2) \wedge ((v12\_altcat\_1 X2) \wedge (l2\_altcat\_1 \\
& X2)))) \Rightarrow (\forall X3.((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 X0 \\
& X1)) \Rightarrow (\forall X4.((v15\_functor0 X4 X0 X1) \wedge (m2\_functor0 X4 X0 X1)) \Rightarrow \\
& (\forall X5.((v15\_functor0 X5 X1 X2) \wedge (m2\_functor0 X5 X1 X2)) \Rightarrow ( \\
& \forall X6.((v15\_functor0 X6 X1 X2) \wedge (m2\_functor0 X6 X1 X2)) \Rightarrow (( \\
& (r1\_functor2 X0 X1 X3 X4) \wedge (r1\_functor2 X1 X2 X5 X6)) \Rightarrow (r1\_functor2 \\
& X0 X2 (k1\_functor3 X0 X1 X2 X3 X5) (k1\_functor3 X0 X1 X2 X4 X6))))))))))
\end{aligned}$$