

# t19\_functor3 (TMQGRSbhgjm- toXGq1aGmi6RFmhDb3NPEHG)

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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  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_functor3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_functor3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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  $k13\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  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  $v12\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (k2\_functor2 \\ & X0 X1 X2 X2 (k1\_functor2 X0 X1 X2) X3 = k8\_altcat\_1 X1 (k3\_functor0 \\ & X0 X1 X2 X3)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3.(m2\_functor0 X3 X0 X1) \Rightarrow ((r1\_functor2 X0 X1 \\ & X2 X3) \Rightarrow (\forall X4.(m1\_functor2 X4 X0 X1 X2 X3) \Rightarrow (\forall X5.(m1\_functor2 \\ & X5 X0 X1 X2 X3) \Rightarrow ((\forall X6.(m1\_subset\_1 X6 (u1\_struct\_0 X0)) \Rightarrow \\ & (k2\_functor2 X0 X1 X2 X3 X4 X6 = k2\_functor2 X0 X1 X2 X3 X5 X6)) \Rightarrow (r8\_pboole \\ & (u1\_struct\_0 X0) X4 X5))))))))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_altcat\_1 X0)) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v1\_altcat\_2 X1) \wedge (l2\_altcat\_1 X1))) \Rightarrow (\forall X2. \\
& ((\neg v2\_struct\_0 X2) \wedge ((v1\_altcat\_2 X2) \wedge (l2\_altcat\_1 X2))) \Rightarrow (\forall X3. \\
& ((v6\_functor0 X3 X0 X1) \wedge ((v8\_functor0 X3 X0 X1) \wedge (l2\_functor0 X3 \\
& X0 X1))) \Rightarrow (\forall X4.(l2\_functor0 X4 X1 X2) \Rightarrow (\forall X5.(m1\_subset\_1 \\
& X5 (u1\_struct\_0 X0)) \Rightarrow (k3\_functor0 X0 X2 (k13\_functor0 X0 X1 X2 X3 \\
& X4) X5 = k3\_functor0 X1 X2 X4 (k3\_functor0 X0 X1 X3 X5))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
& X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\
& X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((v15\_functor0 \\
& X2 X0 X1) \wedge (m2\_functor0 X2 X0 X1)) \Rightarrow (\forall X3.(m1\_subset\_1 X3 ( \\
& u1\_struct\_0 X0)) \Rightarrow (k6\_functor0 X0 X1 X2 X3 X3 (k8\_altcat\_1 X0 X3) = \\
& k8\_altcat\_1 X1 (k3\_functor0 X0 X1 X2 X3))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\
& X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\
& X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((\neg \\
& v2\_struct\_0 X2) \wedge ((v2\_altcat\_1 X2) \wedge ((v12\_altcat\_1 X2) \wedge (l2\_altcat\_1 \\
& X2)))) \Rightarrow (\forall X3.((v15\_functor0 X3 X2 X1) \wedge (m2\_functor0 X3 X2 \\
& X1)) \Rightarrow (\forall X4.((v15\_functor0 X4 X2 X1) \wedge (m2\_functor0 X4 X2 X1)) \Rightarrow \\
& (\forall X5.((v15\_functor0 X5 X1 X0) \wedge (m2\_functor0 X5 X1 X0)) \Rightarrow ( \\
& \forall X6.(m1\_functor2 X6 X2 X1 X3 X4) \Rightarrow (\forall X7.(m1\_subset\_1 \\
& X7 (u1\_struct\_0 X2)) \Rightarrow ((r1\_functor2 X2 X1 X3 X4) \Rightarrow (k2\_functor2 X2 \\
& X0 (k1\_functor3 X2 X1 X0 X3 X5) (k1\_functor3 X2 X1 X0 X4 X5) (k5\_functor3 \\
& X2 X1 X0 X3 X4 X6 X5) X7 = k6\_functor0 X1 X0 X5 (k3\_functor0 X2 X1 X3 X7) \\
& (k3\_functor0 X2 X1 X4 X7) (k2\_functor2 X2 X1 X3 X4 X6 X7))))))))))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\
& (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge ( \\
& l2\_altcat\_1 X1)))) \wedge ((m2\_functor0 X2 X0 X1) \wedge (m2\_functor0 X3 X0 \\
& X1)))) \Rightarrow (r1\_functor2 X0 X1 X2 X2)
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge (v2\_altcat\_1 \\ & X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0))) \wedge ((\neg v2\_struct\_0 \\ & X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge \\ & ((v15\_functor0 X2 X0 X1) \wedge (m2\_functor0 X2 X0 X1))) \Rightarrow (k4\_functor2 \\ & X0 X1 X2 = k1\_functor2 X0 X1 X2) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((\neg v2\_struct\_0 \\ & X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge ( \\ & l2\_altcat\_1 X1)))) \wedge (((\neg v2\_struct\_0 X2) \wedge ((v12\_altcat\_1 X2) \wedge \\ & (l2\_altcat\_1 X2))) \wedge ((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 \\ & X0 X1)) \wedge ((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)))))) \Rightarrow ( \\ & k1\_functor3 X0 X1 X2 X3 X4 = k13\_functor0 X0 X1 X2 X3 X4) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\ & ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\ & ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\ & X2 X0 X1) \Rightarrow (l2\_functor0 X2 X0 X1)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((l1\_altcat\_1 X0) \wedge (l1\_altcat\_1 X1)) \Rightarrow ( \\ & \forall X2. (l2\_functor0 X2 X0 X1) \Rightarrow (l1\_functor0 X2 X0 X1)) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0. (l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\ & \forall X6. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \wedge (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge (((\neg v2\_struct\_0 \\ & X2) \wedge ((v2\_altcat\_1 X2) \wedge ((v12\_altcat\_1 X2) \wedge (l2\_altcat\_1 X2)))) \wedge \\ & (((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 X0 X1)) \wedge ((v15\_functor0 \\ & X4 X0 X1) \wedge (m2\_functor0 X4 X0 X1)) \wedge ((m1\_functor2 X5 X0 X1 X3 X4) \wedge ( \\ & (v15\_functor0 X6 X1 X2) \wedge (m2\_functor0 X6 X1 X2)))))) \Rightarrow (m1\_functor2 \\ & (k5\_functor3 X0 X1 X2 X3 X4 X5 X6) X0 X2 (k1\_functor3 X0 X1 X2 X3 X6) ( \\ & k1\_functor3 X0 X1 X2 X4 X6)) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. (((\neg v2\_struct\_0 \\ & X0) \wedge (l1\_altcat\_1 X0)) \wedge (((\neg v2\_struct\_0 X1) \wedge (l1\_altcat\_1 X1)) \wedge \\ & ((l1\_functor0 X2 X0 X1) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 X0)))) \Rightarrow \\ & (m1\_subset\_1 (k3\_functor0 X0 X1 X2 X3) (u1\_struct\_0 X1)) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. (((\neg v2\_struct\_0 \\ & X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge \\ & (((\neg v2\_struct\_0 X2) \wedge ((v12\_altcat\_1 X2) \wedge (l2\_altcat\_1 X2)))) \wedge \\ & (((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 X0 X1)) \wedge ((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)))) \Rightarrow \\ & ((v9\_functor0 (k1\_functor3 X0 X1 X2 X3 X4) X0 X2) \wedge ((v15\_functor0 (k1\_functor3 X0 X1 X2 X3 X4) X0 X2) \wedge (m2\_functor0 (k1\_functor3 X0 X1 X2 X3 X4) X0 X2))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge \\ & (m2\_functor0 X2 X0 X1)) \Rightarrow (m1\_functor2 (k1\_functor2 X0 X1 X2) X0 X1 X2 X2) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 X2 X0 X1) \Rightarrow ((v15\_functor0 X2 X0 X1) \Rightarrow (v6\_functor0 X2 X0 X1))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l2\_altcat\_1 X0) \Rightarrow (((\neg v2\_struct\_0 X0) \wedge (v12\_altcat\_1 X0)) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge (v1\_altcat\_2 X0))) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 X2 X0 X1) \Rightarrow ((v8\_functor0 X2 X0 X1) \wedge (v12\_functor0 X2 X0 X1))) \end{aligned} \quad (18)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.((\neg \\ & v2\_struct\_0 X2) \wedge ((v2\_altcat\_1 X2) \wedge ((v12\_altcat\_1 X2) \wedge (l2\_altcat\_1 \\ & X2)))) \Rightarrow (\forall X3.((v15\_functor0 X3 X0 X1) \wedge (m2\_functor0 X3 X0 \\ & X1)) \Rightarrow (\forall X4.((v15\_functor0 X4 X1 X2) \wedge (m2\_functor0 X4 X1 X2)) \Rightarrow \\ & (r8\_pboole (u1\_struct\_0 X0) (k5\_functor3 X0 X1 X2 X3 X3 (k4\_functor2 \\ & X0 X1 X3) X4) (k4\_functor2 X0 X2 (k1\_functor3 X0 X1 X2 X3 X4)))))) \end{aligned}$$