

# t5\_functor2

(TMYoakokyMZyApCKE4LEY9rg7xsi3J622Nh)

October 27, 2020

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  $m2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r8\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_functor2 : \iota \Rightarrow \iota \Rightarrow \iota$  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  $k8\_altcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  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  $l2\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_altcat\_1 : \iota \Rightarrow o$  be given. Let  $l1\_functor0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\
& X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\
& (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 X0 X1 X2 \neq k1\_xboole\_0) \Rightarrow \\
& (\forall X3.(m1\_subset\_1 X3 (k1\_altcat\_1 X0 X1 X2)) \Rightarrow (k5\_altcat\_1 \\
& X0 X1 X2 X2 X3 (k8\_altcat\_1 X0 X2) = X3))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge \\
& (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge \\
& l2\_altcat\_1 X1)))) \wedge ((m2\_functor0 X2 X0 X1) \wedge (m2\_functor0 X3 X0 \\
& X1)))) \Rightarrow (r1\_functor2 X0 X1 X2 X2)
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge \\
& ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge ((\neg v2\_struct\_0 X1) \wedge \\
& ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\
& X2 X0 X1) \Rightarrow (l2\_functor0 X2 X0 X1))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.((l1\_altcat\_1 X0) \wedge (l1\_altcat\_1 X1)) \Rightarrow ( \\
& \forall X2.(l2\_functor0 X2 X0 X1) \Rightarrow (l1\_functor0 X2 X0 X1))
\end{aligned} \tag{6}$$

Assume the following.

$$\forall X0.(l2\_altcat\_1 X0) \Rightarrow (l1\_altcat\_1 X0) \tag{7}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0) \wedge (l1\_altcat\_1 X0)) \wedge (((\neg v2\_struct\_0 X1) \wedge (l1\_altcat\_1 X1)) \wedge \\
& ((l1\_functor0 X2 X0 X1) \wedge (m1\_subset\_1 X3 (u1\_struct\_0 X0)))))) \Rightarrow \\
& (m1\_subset\_1 (k3\_functor0 X0 X1 X2 X3) (u1\_struct\_0 X1))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 X0) \wedge \\
& l2\_altcat\_1 X0)))) \wedge (((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 X1) \wedge \\
& (v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge ((m2\_functor0 X2 X0 X1) \wedge \\
& ((m2\_functor0 X3 X0 X1) \wedge ((m1\_functor2 X4 X0 X1 X2 X3) \wedge (m1\_subset\_1 \\
& X5 (u1\_struct\_0 X0)))))) \Rightarrow (m1\_subset\_1 (k2\_functor2 X0 X1 X2 X3 \\
& X4 X5) (k1\_altcat\_1 X1 (k3\_functor0 X0 X1 X2 X5) (k3\_functor0 X0 X1 \\
& X3 X5)))
\end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 \\ & X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 X0)))) \wedge (((\neg v2\_struct\_0 \\ & X1) \wedge ((v2\_altcat\_1 X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \wedge \\ & (m2\_functor0 X2 X0 X1))) \Rightarrow (m1\_functor2 (k1\_functor2 X0 X1 X2) X0 \\ & X1 X2 X2) \end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3. (m2\_functor0 X3 X0 X1) \Rightarrow (\forall X4. (m2\_functor0 \\ & X4 X0 X1) \Rightarrow (((r1\_functor2 X0 X1 X2 X3) \wedge (r1\_functor2 X0 X1 X3 X4)) \Rightarrow \\ & (\forall X5. (m1\_functor2 X5 X0 X1 X2 X3) \Rightarrow (\forall X6. (m1\_functor2 \\ & X6 X0 X1 X3 X4) \Rightarrow (\forall X7. (m1\_functor2 X7 X0 X1 X2 X4) \Rightarrow ((X7 = k3\_functor2 \\ & X0 X1 X2 X3 X4 X5 X6) \Leftrightarrow (\forall X8. (m1\_subset\_1 X8 (u1\_struct\_0 X0)) \Rightarrow \\ & (k2\_functor2 X0 X1 X2 X4 X7 X8 = k5\_altcat\_1 X1 (k3\_functor0 X0 X1 X2 \\ & X8) (k3\_functor0 X0 X1 X3 X8) (k3\_functor0 X0 X1 X4 X8) (k2\_functor2 \\ & X0 X1 X2 X3 X5 X8) (k2\_functor2 X0 X1 X3 X4 X6 X8)))))))))) \end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2. (m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3. (m2\_functor0 X3 X0 X1) \Rightarrow ((r1\_functor2 X0 X1 \\ & X2 X3) \Leftrightarrow (\forall X4. (m1\_subset\_1 X4 (u1\_struct\_0 X0)) \Rightarrow (k1\_altcat\_1 \\ & X1 (k3\_functor0 X0 X1 X2 X4) (k3\_functor0 X0 X1 X3 X4) \neq k1\_xboole\_0)))))) \end{aligned} \tag{12}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v12\_altcat\_1 X0) \wedge (l2\_altcat\_1 \\ & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (k1\_altcat\_1 X0 X1 X1)) \Rightarrow ((X2 = k8\_altcat\_1 X0 X1) \Leftrightarrow \\ & (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow ((k1\_altcat\_1 \\ & X0 X1 X3 \neq k1\_xboole\_0) \Rightarrow (\forall X4. (m1\_subset\_1 X4 (k1\_altcat\_1 \\ & X0 X1 X3)) \Rightarrow (k5\_altcat\_1 X0 X1 X1 X3 X2 X4 = X4)))))) \end{aligned} \tag{13}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v2\_altcat\_1 X0) \wedge ((v12\_altcat\_1 \\ & X0) \wedge (l2\_altcat\_1 X0)))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v2\_altcat\_1 \\ & X1) \wedge ((v12\_altcat\_1 X1) \wedge (l2\_altcat\_1 X1)))) \Rightarrow (\forall X2.(m2\_functor0 \\ & X2 X0 X1) \Rightarrow (\forall X3.(m2\_functor0 X3 X0 X1) \Rightarrow ((r1\_functor2 X0 X1 \\ & X2 X3) \Rightarrow (\forall X4.(m1\_functor2 X4 X0 X1 X2 X3) \Rightarrow ((r8\_pboole (u1\_struct\_0 \\ & X0) (k3\_functor2 X0 X1 X2 X3 X3 X4 (k1\_functor2 X0 X1 X3)) X4) \wedge (r8\_pboole \\ & (u1\_struct\_0 X0) (k3\_functor2 X0 X1 X2 X2 X3 (k1\_functor2 X0 X1 X2) \\ & X4) X4)))))) \end{aligned}$$