

# t30\_index\_1 (TMFUxrUUfp- sTyJ14GWqsG5NDDVKKp4mu6rk)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v11\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v2\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v3\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v5\_cat\_1 : \iota \Rightarrow o$  be given. Let  $v6\_cat\_1 : \iota \Rightarrow o$  be given. Let  $l1\_cat\_1 : \iota \Rightarrow o$  be given. Let  $m5\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $u1\_graph\_1 : \iota \Rightarrow \iota$  be given. Let  $u2\_graph\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_cat\_1 : \iota \Rightarrow \iota$  be given. Let  $k7\_isocat\_1 : \iota \Rightarrow \iota$  be given. Let  $m4\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_cat\_5 : \iota \Rightarrow o$  be given. Let  $m2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m3\_cat\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k10\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k15\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_cat\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $l5\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_graph\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  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  $m3\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
& \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\
& X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\
& X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1. (m5\_index\_1 X1 (u1\_struct\_0 \\
& X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) (u1\_cat\_1 \\
& X0) (k7\_isocat\_1 X0)) \Rightarrow (\forall X2. (m4\_index\_1 X2 (u1\_struct\_0 \\
& X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) X1) \Rightarrow (\forall X3. \\
& ((\neg v2\_struct\_0 X3) \wedge ((\neg v11\_struct\_0 X3) \wedge ((v2\_cat\_1 X3) \wedge ((v3\_cat\_1 \\
& X3) \wedge ((v4\_cat\_1 X3) \wedge ((v5\_cat\_1 X3) \wedge ((v6\_cat\_1 X3) \wedge ((v3\_cat\_5 \\
& X3) \wedge (l1\_cat\_1 X3)))))))))) \Rightarrow (\forall X4. (m2\_cat\_1 X4 X2 X3) \Rightarrow (m4\_index\_1 \\
& (k4\_cat\_5 X2 X3 X4) (u1\_struct\_0 X0) (u4\_struct\_0 X0) (u1\_graph\_1 \\
& X0) (u2\_graph\_1 X0) (k15\_index\_1 X0 X1 X2 X3 X4))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v11\_struct\_0 X0) \wedge ((v2\_cat\_1 \\ X0) \wedge ((v3\_cat\_1 X0) \wedge ((v4\_cat\_1 X0) \wedge ((v5\_cat\_1 X0) \wedge ((v6\_cat\_1 \\ X0) \wedge (l1\_cat\_1 X0))))))) \Rightarrow (\forall X1.(m5\_index\_1 X1 (u1\_struct\_0 \\ X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) (u1\_cat\_1 \\ X0) (k7\_isocat\_1 X0)) \Rightarrow (\forall X2.((\neg v2\_struct\_0 X2) \wedge ((\neg v11\_struct\_0 \\ X2) \wedge ((v2\_cat\_1 X2) \wedge ((v3\_cat\_1 X2) \wedge ((v4\_cat\_1 X2) \wedge ((v5\_cat\_1 \\ X2) \wedge ((v6\_cat\_1 X2) \wedge ((v3\_cat\_5 X2) \wedge (l1\_cat\_1 X2)))))))))) \Rightarrow (( \\ m3\_cat\_2 (k10\_index\_1 X0 X1) X2) \Leftrightarrow (m4\_index\_1 X2 (u1\_struct\_0 X0) \\ (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) X1)))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 \\ (u1\_struct\_0 X0)) \quad (3)$$

Assume the following.

$$\forall X0.((\neg v11\_struct\_0 X0) \wedge (l5\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 \\ (u4\_struct\_0 X0)) \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_graph\_1 X0) \Rightarrow ((v1\_funct\_1 (u2\_graph\_1 X0)) \wedge (( \\ v1\_funct\_2 (u2\_graph\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge \\ (m1\_subset\_1 (u2\_graph\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_graph\_1 X0) \Rightarrow ((v1\_funct\_1 (u1\_graph\_1 X0)) \wedge (( \\ v1\_funct\_2 (u1\_graph\_1 X0) (u4\_struct\_0 X0) (u1\_struct\_0 X0)) \wedge \\ (m1\_subset\_1 (u1\_graph\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ X0) (u1\_struct\_0 X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.(l1\_cat\_1 X0) \Rightarrow ((v1\_funct\_1 (u1\_cat\_1 X0)) \wedge (m1\_subset\_1 \\ (u1\_cat\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u4\_struct\_0 \\ X0) (u4\_struct\_0 X0)) (u4\_struct\_0 X0)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\
& ((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 X1 X0)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0))))))\wedge(((v1\_funct\_1 X3)\wedge((v1\_funct\_2 X3 X1 X0)\wedge(m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0))))))\wedge(((v1\_funct\_1 X4)\wedge(m1\_subset\_1 X4 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X1 X1) X1))))\wedge((v1\_funct\_1 X5)\wedge((v1\_funct\_2 X5 X0 X1)\wedge(m1\_subset\_1 X5 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1))))))))))\Rightarrow(\forall X6.(m5\_index\_1 X6 X0 X1 X2 X3 X4 X5)\Rightarrow(m3\_index\_1 X6 X0 X1 X2 X3))
\end{aligned} \tag{8}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 X1 X0)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0))))))\wedge(((v1\_funct\_1 X3)\wedge((v1\_funct\_2 X3 X1 X0)\wedge(m1\_subset\_1 X3 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X1 X0))))))\wedge(m3\_index\_1 X4 X0 X1 X2 X3))))\Rightarrow(\forall X5.(m4\_index\_1 X5 X0 X1 X2 X3 X4)\Rightarrow((\neg v2\_struct\_0 X5)\wedge((\neg v11\_struct\_0 X5)\wedge((v2\_cat\_1 X5)\wedge((v3\_cat\_1 X5)\wedge((v4\_cat\_1 X5)\wedge((v5\_cat\_1 X5)\wedge((v6\_cat\_1 X5)\wedge((v3\_cat\_5 X5)\wedge(l1\_cat\_1 X5))))))))))
\end{aligned} \tag{9}$$

Assume the following.

$$\forall X0.(l5\_struct\_0 X0)\Rightarrow(l1\_struct\_0 X0) \tag{10}$$

Assume the following.

$$\forall X0.(l1\_graph\_1 X0)\Rightarrow(l5\_struct\_0 X0) \tag{11}$$

Assume the following.

$$\forall X0.(l1\_cat\_1 X0)\Rightarrow(l1\_graph\_1 X0) \tag{12}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\Rightarrow((v1\_funct\_1 (k7\_isocat\_1 X0)\wedge((v1\_funct\_2 (k7\_isocat\_1 X0) (u1\_struct\_0 X0) (u4\_struct\_0 X0))\wedge(m1\_subset\_1 (k7\_isocat\_1 X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u4\_struct\_0 X0))))))
\end{aligned} \tag{13}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.(((\neg v2\_struct\_0 \\
& X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 \\
& X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 X0)\wedge(l1\_cat\_1 X0))))))))\wedge((m5\_index\_1 \\
& X1 (u1\_struct\_0 X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 \\
& X0) (u1\_cat\_1 X0) (k7\_isocat\_1 X0))\wedge(((\neg v2\_struct\_0 X2)\wedge((\neg v11\_struct\_0 \\
& X2)\wedge((v2\_cat\_1 X2)\wedge((v3\_cat\_1 X2)\wedge((v4\_cat\_1 X2)\wedge((v5\_cat\_1 \\
& X2)\wedge((v6\_cat\_1 X2)\wedge((v3\_cat\_5 X2)\wedge(l1\_cat\_1 X2))))))))\wedge(( \\
& (\neg v2\_struct\_0 X3)\wedge((\neg v11\_struct\_0 X3)\wedge((v2\_cat\_1 X3)\wedge((v3\_cat\_1 \\
& X3)\wedge((v4\_cat\_1 X3)\wedge((v5\_cat\_1 X3)\wedge((v6\_cat\_1 X3)\wedge((v3\_cat\_5 \\
& X3)\wedge(l1\_cat\_1 X3))))))))\wedge(m2\_cat\_1 X4 X2 X3))))\Rightarrow(m5\_index\_1 \\
& (k15\_index\_1 X0 X1 X2 X3 X4) (u1\_struct\_0 X0) (u4\_struct\_0 X0) (u1\_graph\_1 \\
& X0) (u2\_graph\_1 X0) (u1\_cat\_1 X0) (k7\_isocat\_1 X0))
\end{aligned} \tag{14}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.(((\neg v2\_struct\_0 X0)\wedge((\neg v11\_struct\_0 X0)\wedge((v2\_cat\_1 \\
& X0)\wedge((v3\_cat\_1 X0)\wedge((v4\_cat\_1 X0)\wedge((v5\_cat\_1 X0)\wedge((v6\_cat\_1 \\
& X0)\wedge(l1\_cat\_1 X0))))))))\Rightarrow(\forall X1.(m5\_index\_1 X1 (u1\_struct\_0 \\
& X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) (u1\_cat\_1 \\
& X0) (k7\_isocat\_1 X0))\Rightarrow(\forall X2.(m4\_index\_1 X2 (u1\_struct\_0 \\
& X0) (u4\_struct\_0 X0) (u1\_graph\_1 X0) (u2\_graph\_1 X0) X1)\Rightarrow(\forall X3. \\
& ((\neg v2\_struct\_0 X3)\wedge((\neg v11\_struct\_0 X3)\wedge((v2\_cat\_1 X3)\wedge((v3\_cat\_1 \\
& X3)\wedge((v4\_cat\_1 X3)\wedge((v5\_cat\_1 X3)\wedge((v6\_cat\_1 X3)\wedge((v3\_cat\_5 \\
& X3)\wedge(l1\_cat\_1 X3))))))))\Rightarrow(\forall X4.(m2\_cat\_1 X4 X2 X3)\Rightarrow(m3\_cat\_2 \\
& (k10\_index\_1 X0 (k15\_index\_1 X0 X1 X2 X3 X4) (k4\_cat\_5 X2 X3 X4))))))
\end{aligned}$$