# t38_index_1 (TMK8PSUm49ovzHoF9iN69VrDpZYRgNfmDP8)

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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 $k16\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k14\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v3\_cat\_5 : \iota \Rightarrow o$ be given. Let $k9\_index\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ 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.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge (l1\_cat\_1\ X0)))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0\ X1) \wedge ((\neg v11\_struct\_0\ X1) \wedge ((v2\_cat\_1\ X1) \wedge ((v3\_cat\_1\ X1) \wedge ((v4\_cat\_1\ X1) \wedge ((v5\_cat\_1\ X1) \wedge ((v6\_cat\_1\ X1) \wedge (l1\_cat\_1\ X1)))))))) \Rightarrow (\forall X2.(m2\_cat\_1\ X2\ X0\ X1) \Rightarrow (\forall X3.(m5\_index\_1\ X3\ (u1\_struct\_0\ X1)\ (u4\_struct\_0\ X1)\ (u1\_graph\_1\ X1)\ (u2\_graph\_1\ X1)\ (u1\_cat\_1\ X1)\ (k7\_isocat\_1\ X1)) \Rightarrow (\forall X4.(m4\_index\_1\ X4\ (u1\_struct\_0\ X1)\ (u4\_struct\_0\ X1)\ (u1\_graph\_1\ X1)\ (u2\_graph\_1\ X1)\ X3) \Rightarrow (\forall X5.(m5\_index\_1\ X5\ (u1\_struct\_0\ X4)\ (u4\_struct\_0\ X4)\ (u1\_graph\_1\ X4)\ (u2\_graph\_1\ X4)\ (u1\_cat\_1\ X4)\ (k7\_isocat\_1\ X4)) \Rightarrow (k14\_index\_1\ X0\ X1\ X1\ X2\ (k16\_index\_1\ X1\ X4\ X3\ X5) = k16\_index\_1\ X0\ X4\ (k14\_index\_1\ X0\ X1\ X1\ X2\ X3)\ X5)))))) \tag{1}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((\neg v11\_struct\_0\ X1)\wedge((v2\_cat\_1\ X1)\wedge((v3\_cat\_1\ X1)\wedge((v4\_cat\_1\ X1)\wedge((v5\_cat\_1\ X1)\wedge((v6\_cat\_1\ X1)\wedge((v3\_cat\_5\ X1)\wedge(l1\_cat\_1\ X1))))))))))\Rightarrow(\forall X2.(m5\_index\_1\ X2\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ (u1\_cat\_1\ X0)\ (k7\_isocat\_1\ X0))\Rightarrow(\forall X3.(m5\_index\_1\ X3\ (u1\_struct\_0\ X1)\ (u4\_struct\_0\ X1)\ (u1\_graph\_1\ X1)\ (u2\_graph\_1\ X1)\ (u1\_cat\_1\ X1)\ (k7\_isocat\_1\ X1))\Rightarrow(\forall X4.(m4\_index\_1\ X4\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ X2)\Rightarrow((m4\_index\_1\ X1\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ X2)\Rightarrow(k16\_index\_1\ X0\ X1\ X2\ X3 = k14\_index\_1\ X0\ X4\ X1\ (k9\_index\_1\ X0\ X2\ X4)\ X3)))))) \tag{2}$$

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

Assume the following.

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

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.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\wedge((m5\_index\_1\ X1\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ (u1\_cat\_1\ X0)\ (k7\_isocat\_1\ X0))\wedge(m4\_index\_1\ X2\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ X1)))\Rightarrow(m2\_cat\_1\ (k9\_index\_1\ X0\ X1\ X2)\ X0\ X2) \tag{13}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow((v1\_funct\_1\ (k7\_isocat\_1\ X0))\wedge((v1\_funct\_2\ (k7\_isocat\_1\ X0)\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0))\wedge(m1\_subset\_1\ (k7\_isocat\_1\ X0)\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0))))))) \tag{14}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\wedge(((\neg v2\_struct\_0\ X1)\wedge((\neg v11\_struct\_0\ X1)\wedge((v2\_cat\_1\ X1)\wedge((v3\_cat\_1\ X1)\wedge((v4\_cat\_1\ X1)\wedge((v5\_cat\_1\ X1)\wedge((v6\_cat\_1\ X1)\wedge(l1\_cat\_1\ X1))))))))\wedge((m5\_index\_1\ X2\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ (u1\_cat\_1\ X0)\ (k7\_isocat\_1\ X0))\wedge(m5\_index\_1\ X3\ (u1\_struct\_0\ X1)\ (u4\_struct\_0\ X1)\ (u1\_graph\_1\ X1)\ (u2\_graph\_1\ X1)\ (u1\_cat\_1\ X1)\ (k7\_isocat\_1\ X1)))))\Rightarrow(m5\_index\_1\ (k16\_index\_1\ X0\ X1\ X2\ X3)\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ (u1\_cat\_1\ X0)\ (k7\_isocat\_1\ X0)) \tag{15}$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.(m5\_index\_1\ X1\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ (u1\_cat\_1\ X0)\ (k7\_isocat\_1\ X0))\Rightarrow(\forall X2.(m4\_index\_1\ X2\ (u1\_struct\_0\ X0)\ (u4\_struct\_0\ X0)\ (u1\_graph\_1\ X0)\ (u2\_graph\_1\ X0)\ X1)\Rightarrow(\forall X3.(m5\_index\_1\ X3\ (u1\_struct\_0\ X2)\ (u4\_struct\_0\ X2)\ (u1\_graph\_1\ X2)\ (u2\_graph\_1\ X2)\ (u1\_cat\_1\ X2)\ (k7\_isocat\_1\ X2))\Rightarrow(\forall X4.(m4\_index\_1\ X4\ (u1\_struct\_0\ X2)\ (u4\_struct\_0\ X2)\ (u1\_graph\_1\ X2)\ (u2\_graph\_1\ X2)\ X3)\Rightarrow(\forall X5.(m5\_index\_1\ X5\ (u1\_struct\_0\ X4)\ (u4\_struct\_0\ X4)\ (u1\_graph\_1\ X4)\ (u2\_graph\_1\ X4)\ (u1\_cat\_1\ X4)\ (k7\_isocat\_1\ X4))\Rightarrow(k16\_index\_1\ X0\ X2\ X1\ (k16\_index\_1\ X2\ X4\ X3\ X5) = k16\_index\_1\ X0\ X4\ (k16\_index\_1\ X0\ X2\ X1\ X3)\ X5)))))) $$