t31_catalg_1 (TML1wq8FRBQ78jUB8LDZoXEH8v8kqwy9BNS)

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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 $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $u4\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5\_msualg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3\_catalg\_1 : \iota \Rightarrow \iota$ be given. Let $k10\_catalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k13\_catalg\_1 : \iota \Rightarrow \iota$ be given. Let $k10\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2\_finseq\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3\_graph\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_graph\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge (l1\_cat\_1\ X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X4.(m1\_subset\_1\ X4\ (u4\_struct\_0\ X0)) \Rightarrow (\forall X5.(m1\_subset\_1\ X5\ (u4\_struct\_0\ X0)) \Rightarrow (((X4 \in k2\_cat\_1\ X0\ X1\ X2) \wedge (X5 \in k2\_cat\_1\ X0\ X2\ X3)) \Rightarrow (k1\_funct\_1\ (k5\_msualg\_1\ (k3\_catalg\_1\ (u1\_struct\_0\ X0))\ (k10\_catalg\_1\ (u1\_struct\_0\ X0)\ X1\ X2\ X3)\ (k13\_catalg\_1\ X0))\ (k2\_finseq\_4\ (u4\_struct\_0\ X0)\ X5\ X4) = k1\_cat\_1\ X0\ X4\ X5))))))) \tag{1}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge (l1\_cat\_1\ X0))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u4\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0)) \Rightarrow ((X1 \in k2\_cat\_1\ X0\ X2\ X3) \Leftrightarrow ((k3\_graph\_1\ X0\ X1 = X2) \wedge (k4\_graph\_1\ X0\ X1 = X3)))))) \tag{2}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u4\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u4\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u4\_struct\_0\ X0))\Rightarrow(((k3\_graph\_1\ X0\ X3 = k4\_graph\_1\ X0\ X2)\wedge(k3\_graph\_1\ X0\ X2 = k4\_graph\_1\ X0\ X1))\Rightarrow(k1\_cat\_1\ X0\ (k1\_cat\_1\ X0\ X1\ X2)\ X3 = k1\_cat\_1\ X0\ X1\ (k1\_cat\_1\ X0\ X2\ X3))))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0)))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u4\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u4\_struct\_0\ X0))\Rightarrow((k3\_graph\_1\ X0\ X2 = k4\_graph\_1\ X0\ X1)\Rightarrow((k3\_graph\_1\ X0\ (k1\_cat\_1\ X0\ X1\ X2) = k3\_graph\_1\ X0\ X1)\wedge(k4\_graph\_1\ X0\ (k1\_cat\_1\ X0\ X1\ X2) = k4\_graph\_1\ X0\ X2))))) \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0\ X0)\wedge((m1\_subset\_1\ X1\ X0)\wedge(m1\_subset\_1\ X2\ X0)))\Rightarrow(k2\_finseq\_4\ X0\ X1\ X2 = k10\_finseq\_1\ X1\ X2) \tag{5}$$

Assume the following.

$$\forall X0.((\neg v11\_struct\_0\ X0)\wedge(l5\_struct\_0\ X0))\Rightarrow(\neg v1\_xboole\_0\ (u4\_struct\_0\ X0)) \tag{6}$$

Assume the following.

$$\forall X0.(l1\_graph\_1\ X0)\Rightarrow(l5\_struct\_0\ X0) \tag{7}$$

Assume the following.

$$\forall X0.(l1\_cat\_1\ X0)\Rightarrow(l1\_graph\_1\ X0) \tag{8}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((l1\_cat\_1\ X0)\wedge((m1\_subset\_1\ X1\ (u4\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u4\_struct\_0\ X0))))\Rightarrow(m1\_subset\_1\ (k1\_cat\_1\ X0\ X1\ X2)\ (u4\_struct\_0\ X0)) \tag{9}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0)))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ X0))\Rightarrow(\forall X5.(m1\_subset\_1\ X5\ (u4\_struct\_0\ X0))\Rightarrow(\forall X6.(m1\_subset\_1\ X6\ (u4\_struct\_0\ X0))\Rightarrow(\forall X7.(m1\_subset\_1\ X7\ (u4\_struct\_0\ X0))\Rightarrow(((X5 \in k2\_cat\_1\ X0\ X1\ X2)\wedge((X6 \in k2\_cat\_1\ X0\ X2\ X3)\wedge(X7 \in k2\_cat\_1\ X0\ X3\ X4)))\Rightarrow(k1\_funct\_1\ (k5\_msualg\_1\ (k3\_catalg\_1\ (u1\_struct\_0\ X0))\ (k10\_catalg\_1\ (u1\_struct\_0\ X0)\ X1\ X3\ X4)\ (k13\_catalg\_1\ X0))\ (k10\_finseq\_1\ X7\ (k1\_funct\_1\ (k5\_msualg\_1\ (k3\_catalg\_1\ (u1\_struct\_0\ X0))\ (k10\_catalg\_1\ (u1\_struct\_0\ X0)\ X1\ X2\ X3)\ (k13\_catalg\_1\ X0))\ (k2\_finseq\_4\ (u4\_struct\_0\ X0)\ X6\ X5))) = k1\_funct\_1\ (k5\_msualg\_1\ (k3\_catalg\_1\ (u1\_struct\_0\ X0))\ (k10\_catalg\_1\ (u1\_struct\_0\ X0)\ X1\ X2\ X4)\ (k13\_catalg\_1\ X0))\ (k10\_finseq\_1\ (k1\_funct\_1\ (k5\_msualg\_1\ (k3\_catalg\_1\ (u1\_struct\_0\ X0))\ (k10\_catalg\_1\ (u1\_struct\_0\ X0)\ X2\ X3\ X4)\ (k13\_catalg\_1\ X0))\ (k2\_finseq\_4\ (u4\_struct\_0\ X0)\ X7\ X6))\ X5)))))))))))$$