t23_nattra_1 (TMR8jNvqCrob8pMnc3HMqp5fg2pyujPxYQt)

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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 $m2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r2\_nattra\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1\_nattra\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1\_nattra\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_xboole\_0 : \iota$ be given. Let $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k9\_cat\_3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_nattra\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k5\_nattra\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge (l1\_cat\_1\ X0))))))) \Rightarrow (\forall X1.((\neg v2\_struct\_0\ X1) \wedge ((\neg v11\_struct\_0\ X1) \wedge ((v2\_cat\_1\ X1) \wedge ((v3\_cat\_1\ X1) \wedge ((v4\_cat\_1\ X1) \wedge ((v5\_cat\_1\ X1) \wedge ((v6\_cat\_1\ X1) \wedge (l1\_cat\_1\ X1))))))) \Rightarrow (\forall X2.(m2\_cat\_1\ X2\ X0\ X1) \Rightarrow (\forall X3.(m2\_cat\_1\ X3\ X0\ X1) \Rightarrow (\forall X4.(m2\_cat\_1\ X4\ X0\ X1) \Rightarrow (((r1\_nattra\_1\ X0\ X1\ X2\ X3) \wedge (r1\_nattra\_1\ X0\ X1\ X3\ X4)) \Rightarrow (r1\_nattra\_1\ X0\ X1\ X2\ X4))))))) \tag{1}$$

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(l1\_cat\_1\ X1)))))))\Rightarrow(\forall X2.(m2\_cat\_1\ X2\ X1\ X0)\Rightarrow(\forall X3.(m2\_cat\_1\ X3\ X1\ X0)\Rightarrow(\forall X4.(m2\_cat\_1\ X4\ X1\ X0)\Rightarrow(((r1\_nattra\_1\ X1\ X0\ X2\ X3)\wedge(r1\_nattra\_1\ X1\ X0\ X3\ X4))\Rightarrow(\forall X5.(m1\_nattra\_1\ X5\ X1\ X0\ X2\ X3)\Rightarrow((\forall X6.(m1\_subset\_1\ X6\ (u1\_struct\_0\ X1))\Rightarrow(\forall X7.(m1\_subset\_1\ X7\ (u1\_struct\_0\ X1))\Rightarrow((k2\_cat\_1\ X1\ X6\ X7{\neq}k1\_xboole\_0)\Rightarrow(\forall X8.(m1\_cat\_1\ X8\ X1\ X6\ X7)\Rightarrow(k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X2\ X6)\ (k8\_cat\_1\ X1\ X0\ X2\ X7)\ (k8\_cat\_1\ X1\ X0\ X3\ X7)\ (k9\_cat\_3\ X1\ X6\ X7\ X0\ X2\ X8)\ (k4\_nattra\_1\ X1\ X0\ X2\ X3\ X5\ X7) = k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X2\ X6)\ (k8\_cat\_1\ X1\ X0\ X3\ X6)\ (k8\_cat\_1\ X1\ X0\ X3\ X7)\ (k4\_nattra\_1\ X1\ X0\ X2\ X3\ X5\ X6)\ (k9\_cat\_3\ X1\ X6\ X7\ X0\ X3\ X8))))))\Rightarrow(\forall X6.(m1\_nattra\_1\ X6\ X1\ X0\ X3\ X4)\Rightarrow((\forall X7.(m1\_subset\_1\ X7\ (u1\_struct\_0\ X1))\Rightarrow(\forall X8.(m1\_subset\_1\ X8\ (u1\_struct\_0\ X1))\Rightarrow((k2\_cat\_1\ X1\ X7\ X8{\neq}k1\_xboole\_0)\Rightarrow(\forall X9.(m1\_cat\_1\ X9\ X1\ X7\ X8)\Rightarrow(k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X3\ X7)\ (k8\_cat\_1\ X1\ X0\ X3\ X8)\ (k8\_cat\_1\ X1\ X0\ X4\ X8)\ (k9\_cat\_3\ X1\ X7\ X8\ X0\ X3\ X9)\ (k4\_nattra\_1\ X1\ X0\ X3\ X4\ X6\ X8) = k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X3\ X7)\ (k8\_cat\_1\ X1\ X0\ X4\ X7)\ (k8\_cat\_1\ X1\ X0\ X4\ X8)\ (k4\_nattra\_1\ X1\ X0\ X3\ X4\ X6\ X7)\ (k9\_cat\_3\ X1\ X7\ X8\ X0\ X4\ X9))))))\Rightarrow(\forall X7.(m1\_subset\_1\ X7\ (u1\_struct\_0\ X1))\Rightarrow(\forall X8.(m1\_subset\_1\ X8\ (u1\_struct\_0\ X1))\Rightarrow((k2\_cat\_1\ X1\ X7\ X8{\neq}k1\_xboole\_0)\Rightarrow(\forall X9.(m1\_cat\_1\ X9\ X1\ X7\ X8)\Rightarrow(k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X2\ X7)\ (k8\_cat\_1\ X1\ X0\ X2\ X8)\ (k8\_cat\_1\ X1\ X0\ X4\ X8)\ (k9\_cat\_3\ X1\ X7\ X8\ X0\ X2\ X9)\ (k4\_nattra\_1\ X1\ X0\ X2\ X4\ (k5\_nattra\_1\ X1\ X0\ X2\ X3\ X4\ X5\ X6)\ X8) = k5\_cat\_1\ X0\ (k8\_cat\_1\ X1\ X0\ X2\ X7)\ (k8\_cat\_1\ X1\ X0\ X4\ X7)\ (k8\_cat\_1\ X1\ X0\ X4\ X8)\ (k4\_nattra\_1\ X1\ X0\ X2\ X4\ (k5\_nattra\_1\ X1\ X0\ X2\ X3\ X4\ X5\ X6)\ X7)\ (k9\_cat\_3\ X1\ X7\ X8\ X0\ X4\ X9)))))))))))))) \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5.\forall X6.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0)))))))\wedge(((\neg v2\_struct\_0\ X1)\wedge((\neg v11\_struct\_0\ X1)\wedge((v2\_cat\_1\ X1)\wedge((v3\_cat\_1\ X1)\wedge((v4\_cat\_1\ X1)\wedge((v5\_cat\_1\ X1)\wedge((v6\_cat\_1\ X1)\wedge(l1\_cat\_1\ X1)))))))\wedge((m2\_cat\_1\ X2\ X0\ X1)\wedge((m2\_cat\_1\ X3\ X0\ X1)\wedge((m2\_cat\_1\ X4\ X0\ X1)\wedge((m1\_nattra\_1\ X5\ X0\ X1\ X2\ X3)\wedge(m1\_nattra\_1\ X6\ X0\ X1\ X3\ X4)))))))\Rightarrow(m1\_nattra\_1\ (k5\_nattra\_1\ X0\ X1\ X2\ X3\ X4\ X5\ X6)\ X0\ X1\ X2\ X4) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((\neg v11\_struct\_0\ X1)\wedge((v2\_cat\_1\ X1)\wedge((v3\_cat\_1\ X1)\wedge((v4\_cat\_1\ X1)\wedge((v5\_cat\_1\ X1)\wedge((v6\_cat\_1\ X1)\wedge(l1\_cat\_1\ X1))))))))\Rightarrow(\forall X2.(m2\_cat\_1\ X2\ X0\ X1)\Rightarrow(\forall X3.(m2\_cat\_1\ X3\ X0\ X1)\Rightarrow((r2\_nattra\_1\ X0\ X1\ X2\ X3)\Leftrightarrow((r1\_nattra\_1\ X0\ X1\ X2\ X3)\wedge(\exists X4.(m1\_nattra\_1\ X4\ X0\ X1\ X2\ X3)\wedge(\forall X5.(m1\_subset\_1\ X5\ (u1\_struct\_0\ X0))\Rightarrow(\forall X6.(m1\_subset\_1\ X6\ (u1\_struct\_0\ X0))\Rightarrow((k2\_cat\_1\ X0\ X5\ X6\neq k1\_xboole\_0)\Rightarrow(\forall X7.(m1\_cat\_1\ X7\ X0\ X5\ X6)\Rightarrow(k5\_cat\_1\ X1\ (k8\_cat\_1\ X0\ X1\ X2\ X5)\ (k8\_cat\_1\ X0\ X1\ X2\ X6)\ (k8\_cat\_1\ X0\ X1\ X3\ X6)\ (k9\_cat\_3\ X0\ X5\ X6\ X1\ X2\ X7)\ (k4\_nattra\_1\ X0\ X1\ X2\ X3\ X4\ X6) = k5\_cat\_1\ X1\ (k8\_cat\_1\ X0\ X1\ X2\ X5)\ (k8\_cat\_1\ X0\ X1\ X3\ X5)\ (k8\_cat\_1\ X0\ X1\ X3\ X6)\ (k4\_nattra\_1\ X0\ X1\ X2\ X3\ X4\ X5)\ (k9\_cat\_3\ X0\ X5\ X6\ X1\ X3\ X7)))))))))))) \tag{4}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((\neg v11\_struct\_0\ X1)\wedge((v2\_cat\_1\ X1)\wedge((v3\_cat\_1\ X1)\wedge((v4\_cat\_1\ X1)\wedge((v5\_cat\_1\ X1)\wedge((v6\_cat\_1\ X1)\wedge(l1\_cat\_1\ X1))))))))\Rightarrow(\forall X2.(m2\_cat\_1\ X2\ X0\ X1)\Rightarrow(\forall X3.(m2\_cat\_1\ X3\ X0\ X1)\Rightarrow(\forall X4.(m2\_cat\_1\ X4\ X0\ X1)\Rightarrow(((r2\_nattra\_1\ X0\ X1\ X2\ X3)\wedge(r2\_nattra\_1\ X0\ X1\ X3\ X4))\Rightarrow(r2\_nattra\_1\ X0\ X1\ X2\ X4))))))$$