t32_cat_4 (TMWm-rzEvBpw9xMERvX7WRYVdKCbyeMKBB2i)

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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 $v3\_cat\_4 : \iota \Rightarrow o$ be given. Let $l1\_cat\_4 : \iota \Rightarrow o$ be given. Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k5\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k2\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k14\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2\_cat\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_xboole\_0 : \iota$ be given. Let $k9\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k7\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k8\_cat\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge ((v3\_cat\_4\ X0) \wedge (l1\_cat\_4\ X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X5.(m1\_cat\_1\ X5\ X0\ X1\ X2) \Rightarrow (\forall X6.(m1\_cat\_1\ X6\ X0\ X1\ X3) \Rightarrow (\forall X7.(m1\_cat\_1\ X7\ X0\ X4\ X1) \Rightarrow (\neg(k2\_cat\_1\ X0\ X1\ X2 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1\ X0\ X1\ X3 \neq k1\_xboole\_0) \wedge ((k2\_cat\_1\ X0\ X4\ X1 \neq k1\_xboole\_0) \wedge (k9\_cat\_4\ X0\ X2\ X3\ X4\ (k5\_cat\_1\ X0\ X4\ X1\ X2\ X7\ X5)\ (k5\_cat\_1\ X0\ X4\ X1\ X3\ X7\ X6) \neq k5\_cat\_1\ X0\ X4\ X1\ (k2\_cat\_4\ X0\ X2\ X3)\ X7\ (k9\_cat\_4\ X0\ X2\ X3\ X1\ X5\ X6)))))))))))) \tag{1}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge ((v3\_cat\_4\ X0) \wedge (l1\_cat\_4\ X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (k9\_cat\_4\ X0\ X1\ X2\ (k2\_cat\_4\ X0\ X1\ X2)\ (k7\_cat\_4\ X0\ X1\ X2)\ (k8\_cat\_4\ X0\ X1\ X2) = k4\_cat\_1\ X0\ (k2\_cat\_4\ X0\ X1\ X2)))) \tag{2}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(\neg(k2\_cat\_1\ X0\ X1\ X2\neq k1\_xboole\_0)\wedge((k2\_cat\_1\ X0\ X1\ X3\neq k1\_xboole\_0)\wedge(k2\_cat\_1\ X0\ X1\ (k2\_cat\_4\ X0\ X2\ X3) = k1\_xboole\_0))))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow((k2\_cat\_1\ X0\ (k2\_cat\_4\ X0\ X1\ X2)\ X1\neq k1\_xboole\_0)\wedge(k2\_cat\_1\ X0\ (k2\_cat\_4\ X0\ X1\ X2)\ X2\neq k1\_xboole\_0)))) \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge((m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\wedge((m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\wedge((m1\_cat\_1\ X4\ X0\ X3\ X1)\wedge(m1\_cat\_1\ X5\ X0\ X3\ X2))))))\Rightarrow(m1\_cat\_1\ (k9\_cat\_4\ X0\ X1\ X2\ X3\ X4\ X5)\ X0\ X3\ (k2\_cat\_4\ X0\ X1\ X2)) \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))))\Rightarrow(m1\_cat\_1\ (k8\_cat\_4\ X0\ X1\ X2)\ X0\ (k2\_cat\_4\ X0\ X1\ X2)\ X2) \tag{6}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))))\Rightarrow(m1\_cat\_1\ (k7\_cat\_4\ X0\ X1\ X2)\ X0\ (k2\_cat\_4\ X0\ X1\ X2)\ X1) \tag{7}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge(l1\_cat\_4\ X0)))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))))\Rightarrow(m1\_subset\_1\ (k2\_cat\_4\ X0\ X1\ X2)\ (u1\_struct\_0\ X0)) \tag{8}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(k14\_cat\_4\ X0\ X1\ X2 = k9\_cat\_4\ X0\ X2\ X1\ (k2\_cat\_4\ X0\ X1\ X2)\ (k8\_cat\_4\ X0\ X1\ X2)\ (k7\_cat\_4\ X0\ X1\ X2)))) \tag{9}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(\forall X3.(m1\_subset\_1\ X3\ (u1\_struct\_0\ X0))\Rightarrow(\forall X4.(m1\_cat\_1\ X4\ X0\ X3\ X1)\Rightarrow(\forall X5.(m1\_cat\_1\ X5\ X0\ X3\ X2)\Rightarrow(\neg(k2\_cat\_1\ X0\ X3\ X1 \neq k1\_xboole\_0)\wedge((k2\_cat\_1\ X0\ X3\ X2 \neq k1\_xboole\_0)\wedge(\neg\forall X6.(m1\_cat\_1\ X6\ X0\ X3\ (k2\_cat\_4\ X0\ X1\ X2))\Rightarrow((X6 = k9\_cat\_4\ X0\ X1\ X2\ X3\ X4\ X5)\Leftrightarrow((k5\_cat\_1\ X0\ X3\ (k2\_cat\_4\ X0\ X1\ X2)\ X1\ X6\ (k7\_cat\_4\ X0\ X1\ X2) = X4)\wedge(k5\_cat\_1\ X0\ X3\ (k2\_cat\_4\ X0\ X1\ X2)\ X2\ X6\ (k8\_cat\_4\ X0\ X1\ X2) = X5)))))))))))) \tag{10}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge((v3\_cat\_4\ X0)\wedge(l1\_cat\_4\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))\Rightarrow(k5\_cat\_1\ X0\ (k2\_cat\_4\ X0\ X2\ X1)\ (k2\_cat\_4\ X0\ X1\ X2)\ (k2\_cat\_4\ X0\ X2\ X1)\ (k14\_cat\_4\ X0\ X2\ X1)\ (k14\_cat\_4\ X0\ X1\ X2) = k4\_cat\_1\ X0\ (k2\_cat\_4\ X0\ X2\ X1))))$$