t15_oppcat_1 (TMS9PeUtx7WdieyjzZfcKGor32pM1gCEwUY)

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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 $k2\_oppcat\_1 : \iota \Rightarrow \iota$ 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 $k6\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_oppcat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$ 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 $u4\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $v1\_cat\_1 : \iota \Rightarrow o$ be given. Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge (l1\_cat\_1\ X0))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0)) \Rightarrow (\forall X3.(m1\_cat\_1\ X3\ X0\ X1\ X2) \Rightarrow ((k2\_cat\_1\ X0\ X1\ X2 \neq k1\_xboole\_0) \Rightarrow ((k3\_graph\_1\ X0\ X3 = X1) \wedge (k4\_graph\_1\ X0\ X3 = X2))))))) \tag{1}$$

Assume the following.

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

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0) \wedge ((\neg v11\_struct\_0\ X0) \wedge ((v2\_cat\_1\ X0) \wedge ((v3\_cat\_1\ X0) \wedge ((v4\_cat\_1\ X0) \wedge ((v5\_cat\_1\ X0) \wedge ((v6\_cat\_1\ X0) \wedge (l1\_cat\_1\ X0)))))))) \Rightarrow (\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0))) \Rightarrow (\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0))) \Rightarrow ((k2\_cat\_1\ (k2\_oppcat\_1\ X0)\ X1\ X2 \neq k1\_xboole\_0) \Rightarrow (\forall X3.(m1\_cat\_1\ X3\ (k2\_oppcat\_1\ X0)\ X1\ X2) \Rightarrow ((k4\_oppcat\_1\ X0\ (k3\_graph\_1\ (k2\_oppcat\_1\ X0)\ X3) = k4\_graph\_1\ X0\ (k6\_oppcat\_1\ X0\ X3)) \wedge (k4\_oppcat\_1\ X0\ (k4\_graph\_1\ (k2\_oppcat\_1\ X0)\ X3) = k3\_graph\_1\ X0\ (k6\_oppcat\_1\ X0\ X3))))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0)))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0)))\Rightarrow(\forall X3.(m1\_cat\_1\ X3\ (k2\_oppcat\_1\ X0)\ X1\ X2)\Rightarrow((k3\_graph\_1\ X0\ (k6\_oppcat\_1\ X0\ X3) = k4\_graph\_1\ (k2\_oppcat\_1\ X0)\ X3)\wedge(k4\_graph\_1\ X0\ (k6\_oppcat\_1\ X0\ X3) = k3\_graph\_1\ (k2\_oppcat\_1\ X0)\ X3)))))) \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge(l1\_cat\_1\ X0)))\wedge((m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\wedge(m1\_subset\_1\ X2\ (u1\_struct\_0\ X0))))\Rightarrow(\forall X3.(m1\_cat\_1\ X3\ X0\ X1\ X2)\Rightarrow(m1\_subset\_1\ X3\ (u4\_struct\_0\ X0))) \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\wedge(m1\_subset\_1\ X1\ (u4\_struct\_0\ (k2\_oppcat\_1\ X0))))\Rightarrow(m1\_subset\_1\ (k6\_oppcat\_1\ X0\ X1)\ (u4\_struct\_0\ X0)) \tag{6}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow((\neg v2\_struct\_0\ (k2\_oppcat\_1\ X0))\wedge((\neg v11\_struct\_0\ (k2\_oppcat\_1\ X0))\wedge((v1\_cat\_1\ (k2\_oppcat\_1\ X0))\wedge(l1\_cat\_1\ (k2\_oppcat\_1\ X0))))) \tag{7}$$

Theorem 1

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v11\_struct\_0\ X0)\wedge((v2\_cat\_1\ X0)\wedge((v3\_cat\_1\ X0)\wedge((v4\_cat\_1\ X0)\wedge((v5\_cat\_1\ X0)\wedge((v6\_cat\_1\ X0)\wedge(l1\_cat\_1\ X0))))))))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0)))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (u1\_struct\_0\ (k2\_oppcat\_1\ X0)))\Rightarrow(\forall X3.(m1\_cat\_1\ X3\ (k2\_oppcat\_1\ X0)\ X1\ X2)\Rightarrow((k2\_cat\_1\ (k2\_oppcat\_1\ X0)\ X1\ X2\neq k1\_xboole\_0)\Rightarrow(m1\_cat\_1\ (k6\_oppcat\_1\ X0\ X3)\ X0\ (k4\_oppcat\_1\ X0\ X2)\ (k4\_oppcat\_1\ X0\ X1))))))$$