t34_closure1 (TMX5Yx3L1y1YnrjxbbbnpoQzwDM8tk7H3RU)

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Let $v1\_relat\_1 : \iota \Rightarrow o$ be given. Let $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v1\_funct\_1 : \iota \Rightarrow o$ be given. Let $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v5\_mssubfam : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m3\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1\_mboolean : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m1\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k5\_mssubfam : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r1\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v2\_relat\_1 : \iota \Rightarrow o$ be given. Let $r2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $r6\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k2\_closure1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k4\_mssubfam : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k3\_mssubfam : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1) \wedge ((v4\_relat\_1\ X1\ X0) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_partfun1\ X1\ X0)))) \Rightarrow (\forall X2.((v1\_relat\_1\ X2) \wedge ((v4\_relat\_1\ X2\ X0) \wedge ((v1\_funct\_1\ X2) \wedge (v1\_partfun1\ X2\ X0)))) \Rightarrow (\forall X3.((v2\_relat\_1\ X3) \wedge (m3\_pboole\ X3\ X0\ (k1\_mboolean\ X0\ X2))) \Rightarrow ((\forall X4.((v1\_relat\_1\ X4) \wedge ((v4\_relat\_1\ X4\ X0) \wedge ((v1\_funct\_1\ X4) \wedge (v1\_partfun1\ X4\ X0)))) \Rightarrow ((r1\_pboole\ X0\ X4\ X3) \Rightarrow (r2\_pboole\ X0\ X1\ X4))) \Rightarrow (r2\_pboole\ X0\ X1\ (k4\_mssubfam\ X0\ X2\ X3)))))) \tag{1}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1) \wedge ((v4\_relat\_1\ X1\ X0) \wedge ((v1\_funct\_1\ X1) \wedge (v1\_partfun1\ X1\ X0)))) \Rightarrow (\forall X2.((v1\_relat\_1\ X2) \wedge ((v4\_relat\_1\ X2\ X0) \wedge ((v1\_funct\_1\ X2) \wedge (v1\_partfun1\ X2\ X0)))) \Rightarrow (\forall X3.(m3\_pboole\ X3\ X0\ (k1\_mboolean\ X0\ X1)) \Rightarrow ((r1\_pboole\ X0\ X2\ X3) \Rightarrow (r2\_pboole\ X0\ (k4\_mssubfam\ X0\ X1\ X3)\ X2)))) \tag{2}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(\forall X2.((v5\_mssubfam\ X2\ X0\ X1)\wedge(m3\_pboole\ X2\ X0\ (k1\_mboolean\ X0\ X1)))\Rightarrow(\forall X3.(m1\_pboole\ X3\ X0\ (k5\_mssubfam\ X0\ X1))\Rightarrow(\exists X4.((v2\_relat\_1\ X4)\wedge(m3\_pboole\ X4\ X0\ (k1\_mboolean\ X0\ X1)))\wedge(\forall X5.((v1\_relat\_1\ X5)\wedge((v4\_relat\_1\ X5\ X0)\wedge((v1\_funct\_1\ X5)\wedge(v1\_partfun1\ X5\ X0))))\Rightarrow((r1\_pboole\ X0\ X5\ X4)\Leftrightarrow((r1\_pboole\ X0\ X5\ X2)\wedge(r2\_pboole\ X0\ X3\ X5)))))))) \tag{3}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(\forall X2.((v1\_relat\_1\ X2)\wedge((v4\_relat\_1\ X2\ X0)\wedge((v1\_funct\_1\ X2)\wedge(v1\_partfun1\ X2\ X0))))\Rightarrow(((r2\_pboole\ X0\ X1\ X2)\wedge(r2\_pboole\ X0\ X2\ X1))\Rightarrow(r6\_pboole\ X0\ X1\ X2))) \tag{4}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\wedge((v1\_relat\_1\ X2)\wedge((v4\_relat\_1\ X2\ X0)\wedge((v1\_funct\_1\ X2)\wedge(v1\_partfun1\ X2\ X0)))))\Rightarrow(r2\_pboole\ X0\ X1\ X1) \tag{5}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\wedge((v1\_relat\_1\ X2)\wedge((v4\_relat\_1\ X2\ X0)\wedge((v1\_funct\_1\ X2)\wedge(v1\_partfun1\ X2\ X0)))))\Rightarrow((r6\_pboole\ X0\ X1\ X2)\Leftrightarrow(X1=X2)) \tag{6}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(k5\_mssubfam\ X0\ X1=k1\_mboolean\ X0\ X1) \tag{7}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\wedge(m3\_pboole\ X2\ X0\ (k1\_mboolean\ X0\ X1)))\Rightarrow(k4\_mssubfam\ X0\ X1\ X2=k3\_mssubfam\ X0\ X1\ X2) \tag{8}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(\forall X2.(m1\_pboole\ X2\ X0\ X1)\Rightarrow((v1\_relat\_1\ X2)\wedge((v4\_relat\_1\ X2\ X0)\wedge((v1\_funct\_1\ X2)\wedge(v1\_partfun1\ X2\ X0)))))) \tag{9}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\wedge(m3\_pboole\ X2\ X0\ (k1\_mboolean\ X0\ X1)))\Rightarrow((v1\_relat\_1\ (k3\_mssubfam\ X0\ X1\ X2))\wedge((v4\_relat\_1\ (k3\_mssubfam\ X0\ X1\ X2)\ X0)\wedge((v1\_funct\_1\ (k3\_mssubfam\ X0\ X1\ X2))\wedge(v1\_partfun1\ (k3\_mssubfam\ X0\ X1\ X2)\ X0)))) \tag{10}$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow((v1\_relat\_1\ (k1\_mboolean\ X0\ X1))\wedge((v4\_relat\_1\ (k1\_mboolean\ X0\ X1)\ X0)\wedge((v1\_funct\_1\ (k1\_mboolean\ X0\ X1))\wedge(v1\_partfun1\ (k1\_mboolean\ X0\ X1)\ X0)))) \tag{11}$$

Theorem 1

$$\forall X0.\forall X1.((v1\_relat\_1\ X1)\wedge((v4\_relat\_1\ X1\ X0)\wedge((v1\_funct\_1\ X1)\wedge(v1\_partfun1\ X1\ X0))))\Rightarrow(\forall X2.((v5\_mssubfam\ X2\ X0\ X1)\wedge(m3\_pboole\ X2\ X0\ (k1\_mboolean\ X0\ X1)))\Rightarrow(\forall X3.(m1\_pboole\ X3\ X0\ (k5\_mssubfam\ X0\ X1))\Rightarrow(\forall X4.(m2\_pboole\ X4\ X0\ (k5\_mssubfam\ X0\ X1)\ (k5\_mssubfam\ X0\ X1))\Rightarrow(((r1\_pboole\ X0\ X3\ X2)\wedge(\forall X5.(m1\_pboole\ X5\ X0\ (k5\_mssubfam\ X0\ X1))\Rightarrow(\forall X6.((v2\_relat\_1\ X6)\wedge(m3\_pboole\ X6\ X0\ (k1\_mboolean\ X0\ X1)))\Rightarrow((\forall X7.((v1\_relat\_1\ X7)\wedge((v4\_relat\_1\ X7\ X0)\wedge((v1\_funct\_1\ X7)\wedge(v1\_partfun1\ X7\ X0))))\Rightarrow((r1\_pboole\ X0\ X7\ X6)\Leftrightarrow((r1\_pboole\ X0\ X7\ X2)\wedge(r2\_pboole\ X0\ X5\ X7))))\Rightarrow(r6\_pboole\ X0\ (k2\_closure1\ X0\ X1\ X4\ X5)\ (k4\_mssubfam\ X0\ X1\ X6))))))\Rightarrow(r6\_pboole\ X0\ (k2\_closure1\ X0\ X1\ X4\ X3)\ X3))))) $$