# t10_lmod_5 (TMa2AcqmFv43YVFz46SUzPfRnmoyBwTai9L)

October 27, 2020

Let $v2\_struct\_0 : \iota \Rightarrow o$ be given. Let $v6\_struct\_0 : \iota \Rightarrow o$ be given. Let $v13\_algstr\_0 : \iota \Rightarrow o$ be given. Let $v3\_group\_1 : \iota \Rightarrow o$ be given. Let $v5\_group\_1 : \iota \Rightarrow o$ be given. Let $v4\_vectsp\_1 : \iota \Rightarrow o$ be given. Let $v5\_vectsp\_1 : \iota \Rightarrow o$ be given. Let $v2\_rlvect\_1 : \iota \Rightarrow o$ be given. Let $v3\_rlvect\_1 : \iota \Rightarrow o$ be given. Let $v4\_rlvect\_1 : \iota \Rightarrow o$ be given. Let $v1\_vectsp\_2 : \iota \Rightarrow o$ be given. Let $l6\_algstr\_0 : \iota \Rightarrow o$ be given. Let $v8\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v9\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v10\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $v11\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $l1\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k1\_lmod\_5 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $k1\_subset\_1 : \iota \Rightarrow \iota$ be given. Let $u1\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $k1\_vectsp\_4 : \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $v1\_xboole\_0 : \iota \Rightarrow o$ be given. Let $k1\_xboole\_0 : \iota$ be given. Let $r1\_struct\_0 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4\_struct\_0 : \iota \Rightarrow \iota$ be given. Let $v7\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1\_vectsp\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$ be given. Let $m2\_vectsp\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$ be given. Let $k4\_vectsp\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$ be given. Let $l2\_algstr\_0 : \iota \Rightarrow o$ be given. Let $l5\_algstr\_0 : \iota \Rightarrow o$ be given. Let $l2\_struct\_0 : \iota \Rightarrow o$ be given. Let $l1\_struct\_0 : \iota \Rightarrow o$ be given. Let $l1\_algstr\_0 : \iota \Rightarrow o$ be given. Let $k1\_zfmisc\_1 : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall X0.(v1\_xboole\_0\ X0) \Rightarrow (X0 = k1\_xboole\_0) \tag{1}$$

Assume the following.

$$\forall X0.\forall X1.((\neg v2\_struct\_0\ X1) \wedge ((v13\_algstr\_0\ X1) \wedge ((v3\_group\_1\ X1) \wedge ((v4\_vectsp\_1\ X1) \wedge ((v5\_vectsp\_1\ X1) \wedge ((v2\_rlvect\_1\ X1) \wedge ((v3\_rlvect\_1\ X1) \wedge ((v4\_rlvect\_1\ X1) \wedge (l6\_algstr\_0\ X1)))))))) \Rightarrow (\forall X2.((\neg v2\_struct\_0\ X2) \wedge ((v13\_algstr\_0\ X2) \wedge ((v8\_vectsp\_1\ X2\ X1) \wedge ((v9\_vectsp\_1\ X2\ X1) \wedge ((v10\_vectsp\_1\ X2\ X1) \wedge ((v11\_vectsp\_1\ X2\ X1) \wedge ((v2\_rlvect\_1\ X2) \wedge ((v3\_rlvect\_1\ X2) \wedge ((v4\_rlvect\_1\ X2) \wedge (l1\_vectsp\_1\ X2\ X1))))))))) \Rightarrow ((r1\_struct\_0\ (k1\_vectsp\_4\ X1\ X2)\ X0) \Leftrightarrow (X0 = k4\_struct\_0\ X2))) \tag{2}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge(l6\_algstr\_0\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(\forall X2.((v7\_vectsp\_1\ X2\ X0)\wedge(m1\_vectsp\_4\ X2\ X0\ X1))\Rightarrow(\forall X3.((v7\_vectsp\_1\ X3\ X0)\wedge(m1\_vectsp\_4\ X3\ X0\ X1))\Rightarrow((\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ X1))\Rightarrow((r1\_struct\_0\ X2\ X4)\Leftrightarrow(r1\_struct\_0\ X3\ X4)))\Rightarrow(X2 = X3)))))) \tag{3}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge(l6\_algstr\_0\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(\forall X2.(m1\_vectsp\_4\ X2\ X0\ X1)\Rightarrow(r1\_struct\_0\ X2\ (k4\_struct\_0\ X1)))) \tag{4}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge(l6\_algstr\_0\ X0))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(\forall X2.(m2\_vectsp\_6\ X2\ X0\ X1\ (k1\_subset\_1\ (u1\_struct\_0\ X1)))\Rightarrow(k4\_vectsp\_6\ X0\ X1\ X2 = k4\_struct\_0\ X1))) \tag{5}$$

Assume the following.

$$\forall X0.v1\_xboole\_0\ (k1\_subset\_1\ X0) \tag{6}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge(l6\_algstr\_0\ X0))))))))))\wedge((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(\forall X2.(m1\_vectsp\_4\ X2\ X0\ X1)\Rightarrow((\neg v2\_struct\_0\ X2)\wedge((v13\_algstr\_0\ X2)\wedge((v8\_vectsp\_1\ X2\ X0)\wedge((v9\_vectsp\_1\ X2\ X0)\wedge((v10\_vectsp\_1\ X2\ X0)\wedge((v11\_vectsp\_1\ X2\ X0)\wedge((v2\_rlvect\_1\ X2)\wedge((v3\_rlvect\_1\ X2)\wedge((v4\_rlvect\_1\ X2)\wedge(l1\_vectsp\_1\ X2\ X0))))))))))) \tag{7}$$

Assume the following.

$$\forall X0.(l6\_algstr\_0\ X0)\Rightarrow((l2\_algstr\_0\ X0)\wedge(l5\_algstr\_0\ X0)) \tag{8}$$

Assume the following.

$$\forall X0.(l2\_struct\_0\ X0)\Rightarrow(l1\_struct\_0\ X0) \tag{9}$$

Assume the following.

$$\forall X0.(l2\_algstr\_0\ X0)\Rightarrow((l2\_struct\_0\ X0)\wedge(l1\_algstr\_0\ X0)) \tag{10}$$

Assume the following.

$$\forall X0.(l1\_struct\_0\ X0)\Rightarrow(\forall X1.(l1\_vectsp\_1\ X1\ X0)\Rightarrow(l2\_algstr\_0\ X1)) \tag{11}$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge(l6\_algstr\_0\ X0))))))))))\wedge((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow((v7\_vectsp\_1\ (k1\_vectsp\_4\ X0\ X1)\ X0)\wedge(m1\_vectsp\_4\ (k1\_vectsp\_4\ X0\ X1)\ X0\ X1)) \tag{12}$$

Assume the following.

$$\forall X0.m1\_subset\_1\ (k1\_subset\_1\ X0)\ (k1\_zfmisc\_1\ X0) \tag{13}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0\ X0)\wedge((\neg v6\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v5\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v1\_vectsp\_2\ X0)\wedge(l6\_algstr\_0\ X0))))))))))))\wedge(((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\wedge(m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ (u1\_struct\_0\ X1)))))\Rightarrow((v7\_vectsp\_1\ (k1\_lmod\_5\ X0\ X1\ X2)\ X0)\wedge(m1\_vectsp\_4\ (k1\_lmod\_5\ X0\ X1\ X2)\ X0\ X1)) \tag{14}$$

Assume the following.

$$\forall X0.(l1\_struct\_0\ X0)\Rightarrow(\forall X1.(r1\_struct\_0\ X0\ X1)\Leftrightarrow(X1 \in u1\_struct\_0\ X0)) \tag{15}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v6\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v5\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v1\_vectsp\_2\ X0)\wedge(l6\_algstr\_0\ X0))))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(\forall X2.(m1\_subset\_1\ X2\ (k1\_zfmisc\_1\ (u1\_struct\_0\ X1)))\Rightarrow(\forall X3.((v7\_vectsp\_1\ X3\ X0)\wedge(m1\_vectsp\_4\ X3\ X0\ X1))\Rightarrow((X3 = k1\_lmod\_5\ X0\ X1\ X2)\Leftrightarrow(u1\_struct\_0\ X3 = ReplSep\ (toset\ (\lambda X4 : \iota.m2\_vectsp\_6\ X4\ X0\ X1\ X2))\ (\lambda X4 : \iota.True)\ (\lambda X4 : \iota.k4\_vectsp\_6\ X0\ X1\ X4)))))) \tag{16}$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0\ X0)\wedge((\neg v6\_struct\_0\ X0)\wedge((v13\_algstr\_0\ X0)\wedge((v3\_group\_1\ X0)\wedge((v5\_group\_1\ X0)\wedge((v4\_vectsp\_1\ X0)\wedge((v5\_vectsp\_1\ X0)\wedge((v2\_rlvect\_1\ X0)\wedge((v3\_rlvect\_1\ X0)\wedge((v4\_rlvect\_1\ X0)\wedge((v1\_vectsp\_2\ X0)\wedge(l6\_algstr\_0\ X0))))))))))\Rightarrow(\forall X1.((\neg v2\_struct\_0\ X1)\wedge((v13\_algstr\_0\ X1)\wedge((v8\_vectsp\_1\ X1\ X0)\wedge((v9\_vectsp\_1\ X1\ X0)\wedge((v10\_vectsp\_1\ X1\ X0)\wedge((v11\_vectsp\_1\ X1\ X0)\wedge((v2\_rlvect\_1\ X1)\wedge((v3\_rlvect\_1\ X1)\wedge((v4\_rlvect\_1\ X1)\wedge(l1\_vectsp\_1\ X1\ X0))))))))))\Rightarrow(k1\_lmod\_5\ X0\ X1\ (k1\_subset\_1\ (u1\_struct\_0\ X1)) = k1\_vectsp\_4\ X0\ X1))$$