

# t45\_matrlin2 (TMNqzzYKQCnGYAAdu- LAo5xANLPkywbFkZeB)

October 27, 2020

Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. 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  $v33\_algstr\_0 : \iota \Rightarrow o$  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  $l6\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $m1\_matrlin : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k11\_matrix13 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k12\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_prvect\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k8\_matrix13 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m1\_vectsp\_7 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k9\_matrix13 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_funct\_1 : \iota \Rightarrow o$  be given. Let  $k10\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $v7\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_matrlin : \iota \Rightarrow \iota \Rightarrow o$  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  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_matrix\_1 : \iota \Rightarrow o$  be given. Let  $m2\_finseq\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k3\_finseq\_2 : \iota \Rightarrow \iota$  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  $l1\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l1\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k2\_matrix\_1 : \iota \Rightarrow \iota$  be given. Let  $k3\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_struct\_0 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned}
& \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge \\
& ((\neg v6\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v33\_algstr\_0 X1) \wedge \\
& (v3\_group\_1 X1) \wedge ((v5\_group\_1 X1) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 \\
& X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_1 X1) \wedge ((v5\_vectsp\_1 X1) \wedge \\
& (l6\_algstr\_0 X1)))))))))) \Rightarrow (\forall X2.((v2\_matrix\_1 X2 X1) \wedge \\
& (m1\_matrix\_1 X2 (u1\_struct\_0 X1) X0 X0)) \Rightarrow ((k8\_matrix13 X1 X2 = X0) \Rightarrow \\
& (m1\_vectsp\_7 (k9\_matrix13 X1 X0 X0 X2) X1 (k6\_prvect\_1 X1 X0))))))
\end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(v7\_ordinal1\ X0) \Rightarrow (\forall X1.(v7\_ordinal1\ X1) \Rightarrow (\forall X2. \\
& ((\neg v2\_struct\_0\ X2) \wedge (\neg v6\_struct\_0\ X2) \wedge (v13\_algstr\_0\ X2) \wedge ( \\
& (v33\_algstr\_0\ X2) \wedge (v3\_group\_1\ X2) \wedge (v5\_group\_1\ X2) \wedge (v2\_rlvect\_1 \\
& X2) \wedge ((v3\_rlvect\_1\ X2) \wedge (v4\_rlvect\_1\ X2) \wedge (v4\_vectsp\_1\ X2) \wedge \\
& (v5\_vectsp\_1\ X2) \wedge (l6\_algstr\_0\ X2)))))) \Rightarrow (\forall X3. \\
& (m1\_matrix\_1\ X3\ (u1\_struct\_0\ X2)\ X1\ X0) \Rightarrow ((k8\_matrix13\ X2\ X3 = X1) \Rightarrow \\
& (v2\_funct\_1\ X3)))
\end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 \\
& X0) \wedge ((\neg v6\_struct\_0\ X0) \wedge (v13\_algstr\_0\ X0) \wedge (v33\_algstr\_0\ X0) \wedge \\
& (v3\_group\_1\ X0) \wedge (v5\_group\_1\ X0) \wedge (v2\_rlvect\_1\ X0) \wedge (v3\_rlvect\_1 \\
& X0) \wedge (v4\_rlvect\_1\ X0) \wedge (v4\_vectsp\_1\ X0) \wedge (v5\_vectsp\_1\ X0) \wedge \\
& (l6\_algstr\_0\ X0)))))) \wedge ((v7\_ordinal1\ X1) \wedge (v7\_ordinal1 \\
& X2) \wedge (m1\_matrix\_1\ X3\ (u1\_struct\_0\ X0)\ X1\ X2)) \Rightarrow (k9\_matrix13\ X0 \\
& X1\ X2\ X3 = k10\_xtuple\_0\ X3)
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.(v7\_ordinal1\ X0) \Rightarrow (\forall X1.((\neg v2\_struct\_0\ X1) \wedge \\
& ((\neg v6\_struct\_0\ X1) \wedge (v13\_algstr\_0\ X1) \wedge (v33\_algstr\_0\ X1) \wedge ( \\
& (v3\_group\_1\ X1) \wedge (v5\_group\_1\ X1) \wedge (v4\_vectsp\_1\ X1) \wedge (v5\_vectsp\_1 \\
& X1) \wedge (v2\_rlvect\_1\ X1) \wedge (v3\_rlvect\_1\ X1) \wedge (v4\_rlvect\_1\ X1) \wedge \\
& (l6\_algstr\_0\ X1)))))) \Rightarrow (k8\_matrix13\ X1\ (k12\_matrix\_1\ X1 \\
& X0) = X0)
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0\ X0) \wedge ((\neg v6\_struct\_0\ X0) \wedge \\
& ((v13\_algstr\_0\ X0) \wedge (v33\_algstr\_0\ X0) \wedge (v3\_group\_1\ X0) \wedge (v5\_group\_1 \\
& X0) \wedge (v2\_rlvect\_1\ X0) \wedge (v3\_rlvect\_1\ X0) \wedge (v4\_rlvect\_1\ X0) \wedge \\
& ((v4\_vectsp\_1\ X0) \wedge (v5\_vectsp\_1\ X0) \wedge (l6\_algstr\_0\ X0)))))) \wedge \\
& (v7\_ordinal1\ X1) \Rightarrow ((v7\_vectsp\_1\ (k6\_prvect\_1\ X0\ X1)\ X0) \wedge (v1\_matrlin \\
& (k6\_prvect\_1\ X0\ X1)\ X0))
\end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0\ X0) \wedge ((\neg v6\_struct\_0\ X0) \wedge \\
& ((v13\_algstr\_0\ X0) \wedge (v33\_algstr\_0\ X0) \wedge (v3\_group\_1\ X0) \wedge (v5\_group\_1 \\
& X0) \wedge (v4\_vectsp\_1\ X0) \wedge (v5\_vectsp\_1\ X0) \wedge (v2\_rlvect\_1\ X0) \wedge \\
& ((v3\_rlvect\_1\ X0) \wedge (v4\_rlvect\_1\ X0) \wedge (l6\_algstr\_0\ X0)))))) \wedge \\
& (v7\_ordinal1\ X1) \Rightarrow ((v7\_vectsp\_1\ (k6\_prvect\_1\ X0\ X1)\ X0) \wedge (v8\_vectsp\_1 \\
& (k6\_prvect\_1\ X0\ X1)\ X0) \wedge (v9\_vectsp\_1\ (k6\_prvect\_1\ X0\ X1)\ X0) \wedge \\
& ((v10\_vectsp\_1\ (k6\_prvect\_1\ X0\ X1)\ X0) \wedge (v11\_vectsp\_1\ (k6\_prvect\_1 \\
& X0\ X1)\ X0)))
\end{aligned} \tag{6}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (\neg v6\_struct\_0 X0) \wedge \\ & ((v13\_algstr\_0 X0) \wedge (v33\_algstr\_0 X0) \wedge (v3\_group\_1 X0) \wedge (v5\_group\_1 \\ & X0) \wedge (v2\_rlvect\_1 X0) \wedge (v3\_rlvect\_1 X0) \wedge (v4\_rlvect\_1 X0) \wedge \\ & ((v4\_vectsp\_1 X0) \wedge (v5\_vectsp\_1 X0) \wedge (l6\_algstr\_0 X0)))))) \wedge \\ & (v7\_ordinal1 X1)) \Rightarrow ((v13\_algstr\_0 (k6\_prvect\_1 X0 X1)) \wedge (v2\_rlvect\_1 \\ & (k6\_prvect\_1 X0 X1)) \wedge (v3\_rlvect\_1 (k6\_prvect\_1 X0 X1)) \wedge (v4\_rlvect\_1 \\ & (k6\_prvect\_1 X0 X1)) \wedge (v7\_vectsp\_1 (k6\_prvect\_1 X0 X1) X0)) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (\neg v6\_struct\_0 X0) \wedge \\ & ((v13\_algstr\_0 X0) \wedge (v33\_algstr\_0 X0) \wedge (v3\_group\_1 X0) \wedge (v5\_group\_1 \\ & X0) \wedge (v4\_vectsp\_1 X0) \wedge (v5\_vectsp\_1 X0) \wedge (v2\_rlvect\_1 X0) \wedge \\ & ((v3\_rlvect\_1 X0) \wedge (v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))) \wedge \\ & (v7\_ordinal1 X1)) \Rightarrow ((\neg v2\_struct\_0 (k6\_prvect\_1 X0 X1)) \wedge (v7\_vectsp\_1 \\ & (k6\_prvect\_1 X0 X1) X0)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((\neg v1\_xboole\_0 X0) \wedge (v7\_ordinal1 \\ & X1) \wedge (v7\_ordinal1 X2)) \Rightarrow (\forall X3. (m1\_matrix\_1 X3 X0 X1 X2) \Rightarrow \\ & ((v1\_matrix\_1 X3) \wedge (m2\_finseq\_1 X3 (k3\_finseq\_2 X0)))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0. (l6\_algstr\_0 X0) \Rightarrow ((l2\_algstr\_0 X0) \wedge (l5\_algstr\_0 X0)) \quad (11)$$

Assume the following.

$$\forall X0. (l2\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (12)$$

Assume the following.

$$\forall X0. (l2\_algstr\_0 X0) \Rightarrow ((l2\_struct\_0 X0) \wedge (l1\_algstr\_0 X0)) \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (\neg v6\_struct\_0 X0) \wedge \\ & ((v13\_algstr\_0 X0) \wedge (v33\_algstr\_0 X0) \wedge (v3\_group\_1 X0) \wedge (v5\_group\_1 \\ & X0) \wedge (v4\_vectsp\_1 X0) \wedge (v5\_vectsp\_1 X0) \wedge (v2\_rlvect\_1 X0) \wedge \\ & ((v3\_rlvect\_1 X0) \wedge (v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))) \wedge \\ & (v7\_ordinal1 X1)) \Rightarrow ((v7\_vectsp\_1 (k6\_prvect\_1 X0 X1) X0) \wedge (l1\_vectsp\_1 \\ & (k6\_prvect\_1 X0 X1) X0)) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge(l6\_algstr\_0 X0))\wedge(v7\_ordinal1 X1))\Rightarrow(m1\_matrix\_1 (k12\_matrix\_1 X0 X1) (u1\_struct\_0 X0) X1 X1) \quad (15)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.\forall X3.(((\neg v2\_struct\_0 X0)\wedge((\neg v6\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v5\_group\_1 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge((v7\_ordinal1 X1)\wedge((v7\_ordinal1 X2)\wedge(m1\_matrix\_1 X3 (u1\_struct\_0 X0) X1 X2))))\Rightarrow(m2\_finseq\_1 (k11\_matrix13 X0 X1 X2 X3) (u1\_struct\_0 (k6\_prvect\_1 X0 X2))) \quad (16)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((\neg v6\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v5\_group\_1 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\Rightarrow(\forall X1.(v7\_ordinal1 X1)\Rightarrow(\forall X2.(v7\_ordinal1 X2)\Rightarrow(\forall X3.(m1\_matrix\_1 X3 (u1\_struct\_0 X0) X1 X2)\Rightarrow(k11\_matrix13 X0 X1 X2 X3 = X3)))) \quad (17)$$

Assume the following.

$$\forall X0.\forall X1.k4\_tarski X0 X1 = k2\_tarski (k2\_tarski X0 X1) (k1\_tarski X0) \quad (18)$$

Assume the following.

$$\forall X0.(((\neg v2\_struct\_0 X0)\wedge((\neg v6\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v33\_algstr\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v5\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\Rightarrow(\forall X1.(((\neg v2\_struct\_0 X1)\wedge((v13\_algstr\_0 X1)\wedge((v8\_vectsp\_1 X1 X0)\wedge((v9\_vectsp\_1 X1 X0)\wedge((v10\_vectsp\_1 X1 X0)\wedge((v11\_vectsp\_1 X1 X0)\wedge((v2\_rlvect\_1 X1)\wedge((v3\_rlvect\_1 X1)\wedge((v4\_rlvect\_1 X1)\wedge((v1\_matrlin X1 X0)\wedge(l1\_vectsp\_1 X1 X0))))))))))\Rightarrow(\forall X2.(m2\_finseq\_1 X2 (u1\_struct\_0 X1))\Rightarrow((m1\_matrlin X2 X0 X1)\Leftrightarrow((v2\_funct\_1 X2)\wedge(m1\_vectsp\_7 (k10\_xtuple\_0 X2) X0 X1)))) \quad (19)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_struct\_0 X0)) \Rightarrow (\forall X1. \\
& ((v1\_matrix\_1 X1) \wedge (m2\_finseq\_1 X1 (k3\_finseq\_2 (u1\_struct\_0 \\
& X0)))) \Rightarrow ((v2\_matrix\_1 X1 X0) \Leftrightarrow (\forall X2.(v7\_ordinal1 X2) \Rightarrow (\forall X3. \\
& (v7\_ordinal1 X3) \Rightarrow ((k4\_tarski X2 X3 \in k2\_matrix\_1 X1) \Rightarrow ((k3\_matrix\_1 \\
& (u1\_struct\_0 X0) X1 X2 X3 = k4\_struct\_0 X0) \vee (X2 = X3))))))
\end{aligned} \tag{20}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge (l6\_algstr\_0 X0)) \Rightarrow (\forall X1. \\
& (v7\_ordinal1 X1) \Rightarrow (\forall X2.(m1\_matrix\_1 X2 (u1\_struct\_0 X0) \\
& X1 X1) \Rightarrow ((X2 = k12\_matrix\_1 X0 X1) \Leftrightarrow ((\forall X3.(v7\_ordinal1 X3) \Rightarrow \\
& ((k4\_tarski X3 X3 \in k2\_matrix\_1 X2) \Rightarrow (k3\_matrix\_1 (u1\_struct\_0 \\
& X0) X2 X3 X3 = k5\_struct\_0 X0))) \wedge (\forall X3.(v7\_ordinal1 X3) \Rightarrow ( \\
& \forall X4.(v7\_ordinal1 X4) \Rightarrow ((k4\_tarski X3 X4 \in k2\_matrix\_1 X2) \Rightarrow \\
& ((X3 = X4) \vee (k3\_matrix\_1 (u1\_struct\_0 X0) X2 X3 X4 = k4\_struct\_0 X0)))))))))
\end{aligned} \tag{21}$$

Assume the following.

$$\forall X0. \forall X1. k2\_tarski X0 X1 = k2\_tarski X1 X0 \tag{22}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge \\
& ((\neg v6\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v33\_algstr\_0 X1) \wedge ( \\
& (v3\_group\_1 X1) \wedge ((v5\_group\_1 X1) \wedge ((v4\_vectsp\_1 X1) \wedge ((v5\_vectsp\_1 \\
& X1) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge \\
& (l6\_algstr\_0 X1)))))))))) \Rightarrow (m1\_matrlin (k11\_matrix13 X1 X0 \\
& X0 (k12\_matrix\_1 X1 X0)) X1 (k6\_prvect\_1 X1 X0))
\end{aligned}$$