

# t69\_rmod\_4 (TMZTfytE- DotH2XuABDdSBmKaFsYZj6Jbxyh)

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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  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_group\_1 : \iota \Rightarrow o$  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  $v1\_vectsp\_2 : \iota \Rightarrow o$  be given. Let  $l6\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v4\_vectsp\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_vectsp\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k10\_rmod\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_subset\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_rmod\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  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  $m2\_rmod\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_rmod\_4 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_vectsp\_2 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_rmod\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  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.

$$\forall X0.(v1\_xboole\_0 X0) \Rightarrow (X0 = k1\_xboole\_0) \quad (1)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge \\ & ((v3\_group\_1 X1) \wedge ((v4\_vectsp\_1 X1) \wedge ((v5\_vectsp\_1 X1) \wedge ((v2\_rlvect\_1 \\ & X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge (l6\_algstr\_0 X1)))))))) \Rightarrow \\ & (\forall X2. ((\neg v2\_struct\_0 X2) \wedge ((v13\_algstr\_0 X2) \wedge ((v2\_rlvect\_1 \\ & X2) \wedge ((v3\_rlvect\_1 X2) \wedge ((v4\_rlvect\_1 X2) \wedge ((v4\_vectsp\_2 X2 X1) \wedge \\ & (l1\_vectsp\_2 X2 X1))))))) \Rightarrow ((r1\_struct\_0 (k1\_rmod\_2 X1 X2) X0) \Leftrightarrow \\ & (X0 = k4\_struct\_0 X2))) \end{aligned} \quad (2)$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v3\_group\_1 X0) \wedge \\
& (v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge (l6\_algstr\_0 X0)))))))) \Rightarrow \\
& (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 \\
& X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge \\
& (l1\_vectsp\_2 X1 X0))))))) \Rightarrow (\forall X2.(m2\_rmod\_4 X2 X0 X1 (k1\_subset\_1 \\
& (u1\_struct\_0 X1))) \Rightarrow (k5\_rmod\_4 X0 X1 X2 = k4\_struct\_0 X1)))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_group\_1 \\
& X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge \\
& ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))) \Rightarrow \\
& (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 \\
& X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge \\
& (l1\_vectsp\_2 X1 X0))))))) \Rightarrow (\forall X2.((v2\_vectsp\_2 X2 X0) \wedge ( \\
& m1\_rmod\_2 X2 X0 X1)) \Rightarrow (\forall X3.((v2\_vectsp\_2 X3 X0) \wedge (m1\_rmod\_2 \\
& X3 X0 X1)) \Rightarrow ((\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X1)) \Rightarrow ((r1\_struct\_0 \\
& X2 X4) \Leftrightarrow (r1\_struct\_0 X3 X4))) \Rightarrow (X2 = X3))))))
\end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_group\_1 \\
& X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge \\
& ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))) \Rightarrow \\
& (\forall X1.((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 \\
& X1) \wedge ((v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge \\
& (l1\_vectsp\_2 X1 X0))))))) \Rightarrow (\forall X2.(m1\_rmod\_2 X2 X0 X1) \Rightarrow (r1\_struct\_0 \\
& X2 (k4\_struct\_0 X1)))
\end{aligned} \tag{5}$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge \\
& ((v3\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 \\
& X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))) \wedge \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\
& v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge (l1\_vectsp\_2 \\
& X1 X0)))))))) \Rightarrow (\forall X2.(m1\_rmod\_2 X2 X0 X1) \Rightarrow ((\neg v2\_struct\_0 \\
& X2) \wedge ((v13\_algstr\_0 X2) \wedge ((v2\_rlvect\_1 X2) \wedge ((v3\_rlvect\_1 X2) \wedge \\
& ((v4\_rlvect\_1 X2) \wedge ((v4\_vectsp\_2 X2 X0) \wedge (l1\_vectsp\_2 X2 X0))))))))))
\end{aligned} \tag{7}$$

Assume the following.

$$\forall X0.(l6\_algstr\_0 X0) \Rightarrow ((l2\_algstr\_0 X0) \wedge (l5\_algstr\_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0.(l2\_struct\_0 X0) \Rightarrow (l1\_struct\_0 X0) \quad (9)$$

Assume the following.

$$\forall X0.(l2\_algstr\_0 X0) \Rightarrow ((l2\_struct\_0 X0) \wedge (l1\_algstr\_0 X0)) \quad (10)$$

Assume the following.

$$\forall X0.(l1\_struct\_0 X0) \Rightarrow (\forall X1.(l1\_vectsp\_2 X1 X0) \Rightarrow (l2\_algstr\_0 X1)) \quad (11)$$

Assume the following.

$$\forall X0.m1\_subset\_1 (k1\_subset\_1 X0) (k1\_zfmisc\_1 X0) \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge \\ & ((v3\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 \\ & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \wedge \\ & ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge ((v3\_rlvect\_1 \\ & X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge (l1\_vectsp\_2 \\ & X1 X0)))))))))) \Rightarrow ((v2\_vectsp\_2 (k1\_rmod\_2 X0 X1) X0) \wedge (m1\_rmod\_2 \\ & (k1\_rmod\_2 X0 X1) X0 X1)) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 \\ & X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge \\ & ((v4\_rlvect\_1 X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 \\ & X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v1\_vectsp\_2 X0) \wedge (l6\_algstr\_0 X0)))))))))) \wedge \\ & (((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge \\ & (v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge (l1\_vectsp\_2 \\ & X1 X0)))))))))) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 X1)))))) \Rightarrow \\ & ((v2\_vectsp\_2 (k10\_rmod\_4 X0 X1 X2) X0) \wedge (m1\_rmod\_2 (k10\_rmod\_4 \\ & X0 X1 X2) X0 X1)) \end{aligned} \quad (14)$$

Assume the following.

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

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge \\
& ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 \\
& X0) \wedge ((v1\_vectsp\_2 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\
& v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge (l1\_vectsp\_2 \\
& X1 X0)))))) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 \\
& X1))) \Rightarrow (\forall X3.((v2\_vectsp\_2 X3 X0) \wedge (m1\_rmod\_2 X3 X0 X1)) \Rightarrow \\
& ((X3 = k10\_rmod\_4 X0 X1 X2) \Leftrightarrow (u1\_struct\_0 X3 = ReplSep (toset (\lambda X4 : \\
& \iota.m2\_rmod\_4 X4 X0 X1 X2)) (\lambda X4 : \iota.True) (\lambda X4 : \iota.k5\_rmod\_4 \\
& X0 X1 X4))))))
\end{aligned} \tag{16}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\
& X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge \\
& ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 \\
& X0) \wedge ((v1\_vectsp\_2 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1. \\
& ((\neg v2\_struct\_0 X1) \wedge ((v13\_algstr\_0 X1) \wedge ((v2\_rlvect\_1 X1) \wedge (( \\
& v3\_rlvect\_1 X1) \wedge ((v4\_rlvect\_1 X1) \wedge ((v4\_vectsp\_2 X1 X0) \wedge (l1\_vectsp\_2 \\
& X1 X0)))))) \Rightarrow (k10\_rmod\_4 X0 X1 (k1\_subset\_1 (u1\_struct\_0 X1)) = \\
& k1\_rmod\_2 X0 X1))
\end{aligned}$$