

# t12\_ring\_1

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v3\_group\_1 : \iota \Rightarrow o$  be given. Let  $v4\_vectsp\_1 : \iota \Rightarrow o$  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  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_ideal\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_ideal\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_ideal\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_eqrel\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_ring\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_ring\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_relat\_2 : \iota \Rightarrow o$  be given. Let  $v8\_relat\_2 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_eqrel\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_eqrel\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v36\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $k5\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_rlvect\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u2\_algstr\_0 : \iota \Rightarrow \iota$  be given. Let  $k6\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. (m1\_subset\_1 X0 X1) \Rightarrow ((v1\_xboole\_0 X1) \vee (X0 \in X1)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. (X0 \in X1) \Rightarrow (m1\_subset\_1 X0 X1) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. ((v3\_relat\_2 X1) \wedge ((v8\_relat\_2 X1) \wedge ((v1\_partfun1 X1 X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0)))))) \Rightarrow (k8\_eqrel\_1 X0 X1 = k7\_eqrel\_1 X0 X1) \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge \\ & ((v3\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 \\ & X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge \\ & ((\neg v1\_xboole\_0 X1)\wedge((v1\_ideal\_1 X1 X0)\wedge((v2\_ideal\_1 X1 X0)\wedge( \\ & (v3\_ideal\_1 X1 X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))))))\Rightarrow((\neg v1\_xboole\_0 (k1\_ring\_1 X0 X1)\wedge((v1\_partfun1 \\ & (k1\_ring\_1 X0 X1) (u1\_struct\_0 X0)\wedge((v3\_relat\_2 (k1\_ring\_1 X0 \\ & X1)\wedge(v8\_relat\_2 (k1\_ring\_1 X0 X1)))))) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v3\_relat\_2 X1)\wedge((v8\_relat\_2 X1)\wedge((v1\_partfun1 \\ & X1 X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0))))))\Rightarrow \\ & (m1\_subset\_1 (k7\_eqrel\_1 X0 X1) (k1\_zfmisc\_1 (k1\_zfmisc\_1 X0))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.(m1\_subset\_1 X2 ( \\ & k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1)))\Rightarrow(m1\_subset\_1 (k6\_eqrel\_1 X0 \\ & X1 X2 X3) (k1\_zfmisc\_1 X1)) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge \\ & ((v3\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 \\ & X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge \\ & ((\neg v1\_xboole\_0 X1)\wedge((v1\_ideal\_1 X1 X0)\wedge((v2\_ideal\_1 X1 X0)\wedge( \\ & (v3\_ideal\_1 X1 X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))))))\Rightarrow((v36\_algstr\_0 (k2\_ring\_1 X0 X1)\wedge(l6\_algstr\_0 ( \\ & k2\_ring\_1 X0 X1))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge \\ & ((v3\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v5\_vectsp\_1 X0)\wedge((v2\_rlvect\_1 \\ & X0)\wedge((v3\_rlvect\_1 X0)\wedge((v4\_rlvect\_1 X0)\wedge(l6\_algstr\_0 X0))))))))))\wedge \\ & ((\neg v1\_xboole\_0 X1)\wedge((v1\_ideal\_1 X1 X0)\wedge((v2\_ideal\_1 X1 X0)\wedge( \\ & (v3\_ideal\_1 X1 X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))))))\Rightarrow(m1\_subset\_1 (k1\_ring\_1 X0 X1) (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (u1\_struct\_0 X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (8)$$

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 v1\_xboole\_0 X1) \wedge ((v1\_ideal\_1 X1 X0) \wedge ((v2\_ideal\_1 \\
& X1 X0) \wedge ((v3\_ideal\_1 X1 X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\
& X0)))))))))) \Rightarrow (\forall X2.((v36\_algstr\_0 X2) \wedge (l6\_algstr\_0 X2)) \Rightarrow \\
& ((X2 = k2\_ring\_1 X0 X1) \Leftrightarrow ((u1\_struct\_0 X2 = k8\_eqrel\_1 (u1\_struct\_0 \\
& X0) (k1\_ring\_1 X0 X1)) \wedge ((k5\_struct\_0 X2 = k6\_eqrel\_1 (u1\_struct\_0 \\
& X0) (u1\_struct\_0 X0) (k1\_ring\_1 X0 X1) (k5\_struct\_0 X0)) \wedge ((k4\_struct\_0 \\
& X2 = k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) (k1\_ring\_1 X0 \\
& X1) (k4\_struct\_0 X0)) \wedge ((\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 \\
& X2)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X2)) \Rightarrow (\exists X5. \\
& (m1\_subset\_1 X5 (u1\_struct\_0 X0)) \wedge (\exists X6.(m1\_subset\_1 X6 \\
& (u1\_struct\_0 X0)) \wedge ((X3 = k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X0) (k1\_ring\_1 X0 X1) X5) \wedge ((X4 = k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X0) (k1\_ring\_1 X0 X1) X6) \wedge (k5\_binop\_1 (u1\_struct\_0 X2) (u1\_algstr\_0 \\
& X2) X3 X4 = k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) (k1\_ring\_1 \\
& X0 X1) (k3\_rlvect\_1 X0 X5 X6)))))))))) \wedge (\forall X3.(m1\_subset\_1 \\
& X3 (u1\_struct\_0 X2)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 \\
& X2)) \Rightarrow (\exists X5.(m1\_subset\_1 X5 (u1\_struct\_0 X0)) \wedge (\exists X6. \\
& (m1\_subset\_1 X6 (u1\_struct\_0 X0)) \wedge ((X3 = k6\_eqrel\_1 (u1\_struct\_0 \\
& X0) (u1\_struct\_0 X0) (k1\_ring\_1 X0 X1) X5) \wedge ((X4 = k6\_eqrel\_1 (u1\_struct\_0 \\
& X0) (u1\_struct\_0 X0) (k1\_ring\_1 X0 X1) X6) \wedge (k5\_binop\_1 (u1\_struct\_0 \\
& X2) (u2\_algstr\_0 X2) X3 X4 = k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 \\
& X0) (k1\_ring\_1 X0 X1) (k6\_algstr\_0 X0 X5 X6))))))))))))) \tag{9}
\end{aligned}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((v3\_relat\_2 X1) \wedge ((v8\_relat\_2 X1) \wedge ((v1\_partfun1 \\
& X1 X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0)))))) \Rightarrow \\
& (\forall X2.(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k1\_zfmisc\_1 X0))) \Rightarrow \\
& ((X2 = k7\_eqrel\_1 X0 X1) \Leftrightarrow (\forall X3.(m1\_subset\_1 X3 (k1\_zfmisc\_1 \\
& X0)) \Rightarrow ((X3 \in X2) \Leftrightarrow (\exists X4.(X4 \in X0) \wedge (X3 = k6\_eqrel\_1 X0 X0 X1 X4)))))) \tag{10}
\end{aligned}$$

Assume the following.

$$\forall X0.(v1\_xboole\_0 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)) \Rightarrow (v1\_xboole\_0 X1)) \tag{11}$$

**Theorem 1**

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_group\_1 \\ & X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge \\ & ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow \\ & (\forall X1.((\neg v1\_xboole\_0 X1) \wedge ((v1\_ideal\_1 X1 X0) \wedge ((v2\_ideal\_1 \\ X1 X0) \wedge ((v3\_ideal\_1 X1 X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ X0)))))))))) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (m1\_subset\_1 \\ (k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) (k1\_ring\_1 X0 X1) \\ X2) (u1\_struct\_0 (k2\_ring\_1 X0 X1)))))) \end{aligned}$$