

t58\_bilinear  
(TMZ3ubvPWoiugPUVXMuizNueaoxjfEMj84)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $l2\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l1\_vectsp\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_bilinear : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_bilinear : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v8\_bilinear : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_binop\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_algstr\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_rlvect\_1 \\ & X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l2\_algstr\_0 X0)))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow ((k1\_algstr\_0 X0 X1 X2 = k4\_struct\_0 X0) \Rightarrow (X1 = k4\_algstr\_0 \\ & X0 X2)))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_rlvect\_1 \\ & X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l2\_algstr\_0 X0)))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow ((k1\_algstr\_0 X0 X1 (k4\_struct\_0 X0) = X1) \wedge \\ & (k1\_algstr\_0 X0 (k4\_struct\_0 X0) X1 = X1))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned}
& \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l2\_algstr\_0 \\
& X0))) \Rightarrow (\forall X1.((\neg v2\_struct\_0 X1) \wedge (l1\_vectsp\_1 X1 X0)) \Rightarrow ( \\
& \forall X2.((\neg v2\_struct\_0 X2) \wedge (l1\_vectsp\_1 X2 X0)) \Rightarrow (\forall X3. \\
& (m1\_subset\_1 X3 (u1\_struct\_0 X1)) \Rightarrow (\forall X4.(m1\_subset\_1 X4 \\
& (u1\_struct\_0 X1)) \Rightarrow (\forall X5.(m1\_subset\_1 X5 (u1\_struct\_0 X2)) \Rightarrow \\
& (\forall X6.(m1\_subset\_1 X6 (u1\_struct\_0 X2)) \Rightarrow (\forall X7.(( \\
& v1\_funct\_1 X7) \wedge ((v1\_funct\_2 X7 (k2\_zfmisc\_1 (u1\_struct\_0 X1) \\
& (u1\_struct\_0 X2)) (u1\_struct\_0 X0)) \wedge ((v1\_bilinear X7 X0 X1 X2) \wedge \\
& ((v2\_bilinear X7 X0 X1 X2) \wedge (m1\_subset\_1 X7 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\
& (k2\_zfmisc\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X2)) (u1\_struct\_0 \\
& X0)))))) \Rightarrow (k2\_binop\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X2) (u1\_struct\_0 \\
& X0) X7 (k1\_algstr\_0 X1 X3 X4) (k1\_algstr\_0 X2 X5 X6) = k1\_algstr\_0 \\
& X0 (k1\_algstr\_0 X0 (k2\_binop\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X2) \\
& (u1\_struct\_0 X0) X7 X3 X5) (k2\_binop\_1 (u1\_struct\_0 X1) (u1\_struct\_0 \\
& X2) (u1\_struct\_0 X0) X7 X3 X6)) (k1\_algstr\_0 X0 (k2\_binop\_1 (u1\_struct\_0 \\
& X1) (u1\_struct\_0 X2) (u1\_struct\_0 X0) X7 X4 X5) (k2\_binop\_1 (u1\_struct\_0 \\
& X1) (u1\_struct\_0 X2) (u1\_struct\_0 X0) X7 X4 X6))))))))))
\end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. \forall X3. \forall X4. \forall X5. \\
& ((\neg v1\_xboole\_0 X0) \wedge ((\neg v1\_xboole\_0 X1) \wedge (((v1\_funct\_1 X3) \wedge (( \\
& v1\_funct\_2 X3 (k2\_zfmisc\_1 X0 X1) X2) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 \\
& (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1) X2)))) \wedge ((m1\_subset\_1 X4 X0) \wedge \\
& (m1\_subset\_1 X5 X1)))))) \Rightarrow (k2\_binop\_1 X0 X1 X2 X3 X4 X5 = k1\_binop\_1 \\
& X3 X4 X5)
\end{aligned} \tag{4}$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \tag{5}$$

Assume the following.

$$\forall X0.(l2\_algstr\_0 X0) \Rightarrow ((l2\_struct\_0 X0) \wedge (l1\_algstr\_0 X0)) \tag{6}$$

Assume the following.

$$\forall X0.(l1\_struct\_0 X0) \Rightarrow (\forall X1.(l1\_vectsp\_1 X1 X0) \Rightarrow (l2\_algstr\_0 X1)) \tag{7}$$

Assume the following.

$$\forall X0.(l1\_algstr\_0 X0) \Rightarrow (l1\_struct\_0 X0) \tag{8}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.\forall X4.\forall X5. \\ & ((\neg v1\_xboole\_0 X0)\wedge((\neg v1\_xboole\_0 X1)\wedge(((v1\_funct\_1 X3)\wedge(( \\ & v1\_funct\_2 X3 (k2\_zfmisc\_1 X0 X1) X2)\wedge(m1\_subset\_1 X3 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1) X2))))))\wedge((m1\_subset\_1 X4 X0)\wedge \\ & (m1\_subset\_1 X5 X1))))\Rightarrow(m1\_subset\_1 (k2\_binop\_1 X0 X1 X2 X3 X4 \\ & X5) X2) \end{aligned} \tag{9}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((l1\_algstr\_0 X0)\wedge((m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 \\ & (k1\_algstr\_0 X0 X1 X2) (u1\_struct\_0 X0)) \end{aligned} \tag{10}$$

Assume the following.

$$\begin{aligned} & \forall X0.(l2\_algstr\_0 X0)\Rightarrow((v4\_rlvect\_1 X0)\Leftrightarrow(\forall X1.( \\ & m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(k1\_algstr\_0 X0 X1 (k4\_struct\_0 \\ & X0) = X1))) \end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned} & \forall X0.(l2\_struct\_0 X0)\Rightarrow(\forall X1.(l1\_vectsp\_1 X1 X0)\Rightarrow \\ & (\forall X2.((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 (k2\_zfmisc\_1 (u1\_struct\_0 \\ & X1) (u1\_struct\_0 X1)) (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X1)) \\ & (u1\_struct\_0 X0))))))\Rightarrow((v8\_bilinear X2 X0 X1)\Leftrightarrow(\forall X3.(m1\_subset\_1 \\ & X3 (u1\_struct\_0 X1))\Rightarrow(k1\_binop\_1 X2 X3 X3 = k4\_struct\_0 X0)))))) \end{aligned} \tag{12}$$

### Theorem 1

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0)\wedge((v13\_algstr\_0 X0)\wedge((v3\_rlvect\_1 \\ & X0)\wedge((v4\_rlvect\_1 X0)\wedge(l2\_algstr\_0 X0))))\Rightarrow(\forall X1.((\neg \\ & v2\_struct\_0 X1)\wedge(l1\_vectsp\_1 X1 X0))\Rightarrow(\forall X2.((v1\_funct\_1 \\ & X2)\wedge((v1\_funct\_2 X2 (k2\_zfmisc\_1 (u1\_struct\_0 X1) (u1\_struct\_0 \\ & X1)) (u1\_struct\_0 X0))\wedge((v1\_bilinear X2 X0 X1 X1)\wedge((v2\_bilinear \\ & X2 X0 X1 X1)\wedge((v8\_bilinear X2 X0 X1)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X1)) \\ & (u1\_struct\_0 X0))))))))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 \\ & X1))\Rightarrow(\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X1))\Rightarrow(k2\_binop\_1 \\ & (u1\_struct\_0 X1) (u1\_struct\_0 X1) (u1\_struct\_0 X0) X2 X3 X4 = k4\_algstr\_0 \\ & X0 (k2\_binop\_1 (u1\_struct\_0 X1) (u1\_struct\_0 X1) (u1\_struct\_0 \\ & X0) X2 X4 X3)))))) \end{aligned}$$