

## t40\_filter\_2

(TMPZRYyxaCfKr2sw5UmpEVZxzgkojhNyh6e)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v10\_lattices : \iota \Rightarrow o$  be given. Let  $l3\_lattices : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k6\_domain\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_lattice2 : \iota \Rightarrow \iota$  be given. Let  $k3\_filter\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_filter\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_filter\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  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  $g3\_lattices : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v3\_lattices : \iota \Rightarrow o$  be given. Let  $u1\_lattices : \iota \Rightarrow \iota$  be given. Let  $v3\_binop\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $u2\_lattices : \iota \Rightarrow \iota$  be given. Let  $l2\_lattices : \iota \Rightarrow o$  be given. Let  $l1\_lattices : \iota \Rightarrow o$  be given. Let  $v18\_lattices : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v21\_lattices : \iota \Rightarrow \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\
 & X0))) \Rightarrow (\forall X1. ((\neg v1\_xboole\_0 X1) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 \\
 & (u1\_struct\_0 X0)))) \Rightarrow (\forall X2. ((\neg v1\_xboole\_0 X2) \wedge (m1\_subset\_1 \\
 & X2 (k1\_zfmisc\_1 (u1\_struct\_0 (k1\_lattice2 X0)))) \Rightarrow ((k3\_filter\_0 \\
 & (k1\_lattice2 X0) (k3\_filter\_2 X0 X1) = k7\_filter\_2 X0 X1) \wedge ((k3\_filter\_0 \\
 & X0 X1 = k7\_filter\_2 (k1\_lattice2 X0) (k3\_filter\_2 X0 X1)) \wedge ((k3\_filter\_0 \\
 & X0 (k4\_filter\_2 X0 X2) = k7\_filter\_2 (k1\_lattice2 X0) X2) \wedge (k3\_filter\_0 \\
 & (k1\_lattice2 X0) X2 = k7\_filter\_2 X0 (k4\_filter\_2 X0 X2))))))
 \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned}
 & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\
 & X0))) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow ((k6\_filter\_2 \\
 & X0 X1 = k2\_filter\_0 (k1\_lattice2 X0) (k1\_filter\_2 X0 X1)) \wedge (k6\_filter\_2 \\
 & (k1\_lattice2 X0) (k1\_filter\_2 X0 X1) = k2\_filter\_0 X0 X1)))
 \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ & ((\neg v1\_xboole\_0 X2) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 \\ & X0)))) \Rightarrow ((X2 = k6\_domain\_1 (u1\_struct\_0 X0) X1) \Rightarrow (k3\_filter\_0 X0 \\ & X2 = k2\_filter\_0 X0 X1)))) \end{aligned} \quad (3)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((\neg v1\_xboole\_0 X0) \wedge ((m1\_subset\_1 \\ & X1 (k1\_zfmisc\_1 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 X0)))) \Rightarrow ((r1\_filter\_2 \\ & X0 X1 X2) \Leftrightarrow (X1 = X2)) \end{aligned} \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((\neg v1\_xboole\_0 X0) \wedge (m1\_subset\_1 X1 X0)) \Rightarrow \\ & (k6\_domain\_1 X0 X1 = k1\_tarski X1) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_funct\_1 X1) \wedge ((v1\_funct\_2 \\ & X1 (k2\_zfmisc\_1 X0 X0) X0) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X0) X0)))) \wedge ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 \\ & (k2\_zfmisc\_1 X0 X0) X0) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X0) X0)))))) \Rightarrow (\forall X3.\forall X4.\forall X5. \\ & (g3\_lattices X0 X1 X2 = g3\_lattices X3 X4 X5) \Rightarrow ((X0 = X3) \wedge ((X1 = X4) \wedge \\ & (X2 = X5)))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow ((v3\_lattices (k1\_lattice2 X0)) \wedge (v10\_lattices (k1\_lattice2 \\ & X0))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow ((v1\_funct\_1 (u1\_lattices X0)) \wedge ((v1\_funct\_2 (u1\_lattices \\ & X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 \\ & X0)) \wedge (v3\_binop\_1 (u1\_lattices X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 \\ & (u1\_struct\_0 X0)) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge (l3\_lattices \\ & X0))) \Rightarrow ((v1\_funct\_1 (u2\_lattices X0)) \wedge ((v1\_funct\_2 (u2\_lattices \\ & X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)) (u1\_struct\_0 \\ & X0)) \wedge (v3\_binop\_1 (u2\_lattices X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l3\_lattices X0)) \Rightarrow ((\neg v2\_struct\_0 (k1\_lattice2 X0)) \wedge (v3\_lattices (k1\_lattice2 X0))) \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0. (l2\_lattices X0) \Rightarrow & ((v1\_funct\_1 (u2\_lattices X0)) \wedge \\ & ((v1\_funct\_2 (u2\_lattices X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 (u2\_lattices \\ & X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \end{aligned} \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0. (l1\_lattices X0) \Rightarrow & ((v1\_funct\_1 (u1\_lattices X0)) \wedge \\ & ((v1\_funct\_2 (u1\_lattices X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 (u1\_lattices \\ & X0) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) (u1\_struct\_0 X0)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0. (l3\_lattices X0) \Rightarrow ((l1\_lattices X0) \wedge (l2\_lattices X0)) \quad (14)$$

Assume the following.

$$\forall X0. (l2\_lattices X0) \Rightarrow (l1\_struct\_0 X0) \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge \\ (l3\_lattices X0))) \wedge ((\neg v1\_xboole\_0 X1) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ (u1\_struct\_0 X0)))))) \Rightarrow ((\neg v1\_xboole\_0 (k7\_filter\_2 X0 X1)) \wedge (( \\ v18\_lattices (k7\_filter\_2 X0 X1) X0) \wedge ((v21\_lattices (k7\_filter\_2 \\ X0 X1) X0) \wedge (m1\_subset\_1 (k7\_filter\_2 X0 X1) (k1\_zfmisc\_1 (u1\_struct\_0 \\ X0)))))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge ((v10\_lattices X0) \wedge \\ (l3\_lattices X0))) \wedge (m1\_subset\_1 X1 (u1\_struct\_0 X0))) \Rightarrow ((\neg v1\_xboole\_0 \\ (k6\_filter\_2 X0 X1)) \wedge ((v18\_lattices (k6\_filter\_2 X0 X1) X0) \wedge ( \\ v21\_lattices (k6\_filter\_2 X0 X1) X0) \wedge (m1\_subset\_1 (k6\_filter\_2 \\ X0 X1) (k1\_zfmisc\_1 (u1\_struct\_0 X0)))))) \end{aligned} \quad (17)$$

Assume the following.

$$\forall X0. \forall X1. ((\neg v1\_xboole\_0 X0) \wedge (m1\_subset\_1 X1 X0)) \Rightarrow (m1\_subset\_1 (k6\_domain\_1 X0 X1) (k1\_zfmisc\_1 X0)) \quad (18)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices X0)))\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 (k3\_filter\_2 X0 X1) (k1\_zfmisc\_1 (u1\_struct\_0 (k1\_lattice2 X0)))) \quad (19)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices X0)))\wedge(m1\_subset\_1 X1 (u1\_struct\_0 X0)))\Rightarrow(m1\_subset\_1 (k1\_filter\_2 X0 X1) (u1\_struct\_0 (k1\_lattice2 X0))) \quad (20)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v1\_funct\_1 X1)\wedge((v1\_funct\_2 X1 (k2\_zfmisc\_1 X0 X0) X0)\wedge(m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0) X0))))\wedge((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 (k2\_zfmisc\_1 X0 X0) X0)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0) X0))))))\Rightarrow((v3\_lattices (g3\_lattices X0 X1 X2))\wedge(l3\_lattices (g3\_lattices X0 X1 X2))) \quad (21)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices X0)))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0)))\Rightarrow(k3\_filter\_2 X0 X1 = X1)) \quad (22)$$

Assume the following.

$$\forall X0.(l3\_lattices X0)\Rightarrow(k1\_lattice2 X0 = g3\_lattices (u1\_struct\_0 X0) (u1\_lattices X0) (u2\_lattices X0)) \quad (23)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices X0)))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(k1\_filter\_2 X0 X1 = X1)) \quad (24)$$

Assume the following.

$$\forall X0.(l3\_lattices X0)\Rightarrow((v3\_lattices X0)\Rightarrow(X0 = g3\_lattices (u1\_struct\_0 X0) (u2\_lattices X0) (u1\_lattices X0))) \quad (25)$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0 X0)\wedge((v10\_lattices X0)\wedge(l3\_lattices X0)))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.((\neg v1\_xboole\_0 X2)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 X0))))\Rightarrow((r1\_filter\_2 (u1\_struct\_0 X0) X2 (k6\_domain\_1 (u1\_struct\_0 X0) X1))\Rightarrow(r1\_filter\_2 (u1\_struct\_0 X0) (k7\_filter\_2 X0 X2) (k6\_filter\_2 X0 X1))))))$$