

# t23\_roughs\_1 (TM- StyG3guqAhj4rHxJwWsKUDAWumLG116eP)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v3\_roughs\_1 : \iota \Rightarrow o$  be given. Let  $l1\_orders\_2 : \iota \Rightarrow o$  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  $k4\_roughs\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_xboole\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_eqrel\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_orders\_2 : \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0.\forall X1.\forall X2.(\neg(\neg r1\_xboole\_0 X0 (k2\_xboole\_0 X1 X2)) \wedge ((r1\_xboole\_0 X0 X1) \wedge (r1\_xboole\_0 X0 X2))) \wedge (\neg(\neg(r1\_xboole\_0 X0 X1) \wedge (r1\_xboole\_0 X0 X2)) \wedge (r1\_xboole\_0 X0 (k2\_xboole\_0 X1 X2))) \quad (1)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 X0))) \Rightarrow (k4\_subset\_1 X0 X1 X2 = k2\_xboole\_0 X1 X2) \quad (2)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.((m1\_subset\_1 X1 (k1\_zfmisc\_1 X0)) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 X0))) \Rightarrow (m1\_subset\_1 (k4\_subset\_1 X0 X1 X2) (k1\_zfmisc\_1 X0)) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.(((\neg v2\_struct\_0 X0) \wedge (l1\_orders\_2 X0)) \wedge (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0)))) \Rightarrow (m1\_subset\_1 (k4\_roughs\_1 X0 X1) (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \quad (4)$$

Assume the following.

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_orders\_2 X0)) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 X0))) \Rightarrow (k4\_roughs\_1 X0 X1 = \text{ReplSep} (\text{toset} (\lambda X2 : \iota. m1\_subset\_1 X2 (u1\_struct\_0 X0))) (\lambda X2 : \iota. \neg r1\_xboole\_0 (k6\_eqrel\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) (u1\_orders\_2 X0) X2) X1) (\lambda X2 : \iota. X2))) \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(X2 = k2\_xboole\_0 X0 X1) \Leftrightarrow (\forall X3. \\ (X3 \in X2) \Leftrightarrow ((X3 \in X0) \vee (X3 \in X1))) \end{aligned} \quad (6)$$

Assume the following.

$$\forall X0.\forall X1.k2\_xboole\_0 X0 X1 = k2\_xboole\_0 X1 X0 \quad (7)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v3\_roughs\_1 X0) \wedge (l1\_orders\_2 \\ X0))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 (u1\_struct\_0 \\ X0))) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (k1\_zfmisc\_1 (u1\_struct\_0 \\ X0))) \Rightarrow (k4\_roughs\_1 X0 (k4\_subset\_1 (u1\_struct\_0 X0) X1 X2) = k4\_subset\_1 \\ (u1\_struct\_0 X0) (k4\_roughs\_1 X0 X1) (k4\_roughs\_1 X0 X2)))))) \end{aligned}$$