

# t33\_taxonom1 (TMPv- AbAbz4KjGGFTSZuPX5GVVsmY57kp8hk)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l1\_metric\_1 : \iota \Rightarrow o$  be given. Let  $v1\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $r2\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k3\_taxonom1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_taxonom1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $u1\_metric\_1 : \iota \Rightarrow \iota$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  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  $k1\_numbers : \iota$  be given. Let  $k4\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_taxonom1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_xreal\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_tarski : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_tarski : \iota \Rightarrow \iota$  be given. Let  $k1\_metric\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. \forall X3. ((m1\_subset\_1 X2 \\ & (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1))) \wedge (m1\_subset\_1 X3 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1)))) \Rightarrow ((r2\_relset\_1 X0 X1 X2 X3) \Leftrightarrow (X2 = X3)) \end{aligned} \quad (1)$$

Assume the following.

$$\forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\neg v1\_xboole\_0 (u1\_struct\_0 X0)) \quad (2)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_metric\_1 X0) \Rightarrow ((v1\_funct\_1 (u1\_metric\_1 X0)) \wedge \\ & ((v1\_funct\_2 (u1\_metric\_1 X0) (k2\_zfmisc\_1 (u1\_struct\_0 X0) ( \\ & u1\_struct\_0 X0)) k1\_numbers) \wedge (m1\_subset\_1 (u1\_metric\_1 X0) ( \\ & k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 \\ & X0)) k1\_numbers)))))) \end{aligned} \quad (3)$$

Assume the following.

$$\forall X0. (l1\_metric\_1 X0) \Rightarrow (l1\_struct\_0 X0) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. (((\neg v2\_struct\_0 X0) \wedge (l1\_metric\_1 X0)) \wedge \\ & (v1\_xreal\_0 X1)) \Rightarrow (m1\_subset\_1 (k3\_taxonom1 X0 X1) (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0)))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge (l1\_metric\_1 X0)) \Rightarrow (\forall X1. \\ & (v1\_xreal\_0 X1) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 \\ & (u1\_struct\_0 X0) (u1\_struct\_0 X0)))) \Rightarrow ((X2 = k3\_taxonom1 X0 X1) \Leftrightarrow \\ & (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (\forall X4. (m1\_subset\_1 \\ & X4 (u1\_struct\_0 X0)) \Rightarrow ((k4\_tarski X3 X4 \in X2) \Leftrightarrow (r1\_taxonom1 X0 X1 \\ & X3 X4)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_metric\_1 X0) \Rightarrow (\forall X1. (v1\_xreal\_0 X1) \Rightarrow (\forall X2. \\ & (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 \\ & (u1\_struct\_0 X0)) \Rightarrow ((r1\_taxonom1 X0 X1 X2 X3) \Leftrightarrow (r1\_xreal\_0 (k2\_metric\_1 \\ & X0 X2 X3) X1)))) \end{aligned} \quad (7)$$

Assume the following.

$$\forall X0. \forall X1. k4\_tarski X0 X1 = k2\_tarski (k2\_tarski X0 X1) (k1\_tarski X0) \quad (8)$$

Assume the following.

$$\begin{aligned} & \forall X0. (\neg v1\_xboole\_0 X0) \Rightarrow (\forall X1. ((v1\_funct\_1 X1) \wedge ( \\ & m1\_subset\_1 X1 (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k2\_zfmisc\_1 X0 X0) k1\_numbers)))) \Rightarrow \\ & (\forall X2. (v1\_xreal\_0 X2) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X0)) \Rightarrow ((X3 = k1\_taxonom1 X0 X1 X2) \Leftrightarrow (\forall X4. \\ & (m1\_subset\_1 X4 X0) \Rightarrow (\forall X5. (m1\_subset\_1 X5 X0) \Rightarrow ((k4\_tarski \\ & X4 X5 \in X3) \Leftrightarrow (r1\_xreal\_0 (k1\_metric\_1 X0 X0 X1 X4 X5) X2)))))) \end{aligned} \quad (9)$$

Assume the following.

$$\begin{aligned} & \forall X0. (l1\_metric\_1 X0) \Rightarrow (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (k2\_metric\_1 \\ & X0 X1 X2 = k1\_metric\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) (u1\_metric\_1 \\ & X0) X1 X2))) \end{aligned} \quad (10)$$

Assume the following.

$$\forall X0. \forall X1. k2\_tarski X0 X1 = k2\_tarski X1 X0 \quad (11)$$

**Theorem 1**

$$\forall X0.((\neg v2\_struct\_0 X0) \wedge (l1\_metric\_1 X0)) \Rightarrow (\forall X1. \\ (v1\_xreal\_0 X1) \Rightarrow (r2\_reset\_1 (u1\_struct\_0 X0) (u1\_struct\_0 X0) \\ (k3\_taxonom1 X0 X1) (k1\_taxonom1 (u1\_struct\_0 X0) (u1\_metric\_1 \\ X0) X1)))$$