

t20\_autalg\_1  
(TMb7zkcmyzuq2c4Mu12ftwtPrzH4vva7vqL)

October 27, 2020

Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_pzfmisc1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k4\_autalg\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_card\_3 : \iota \Rightarrow \iota$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_relset\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_funcop\_1 : \iota \Rightarrow o$  be given. Let  $k7\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\begin{aligned} & \forall X0.((v1\_relat\_1 X0) \wedge (v1\_funct\_1 X0)) \Rightarrow (\forall X1.(( \\ & v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1)) \Rightarrow ((X0 \in k4\_card\_3 X1) \Leftrightarrow ((k9\_xtuple\_0 \\ & X0 = k9\_xtuple\_0 X1) \wedge (\forall X2.(X2 \in k9\_xtuple\_0 X1) \Rightarrow (k1\_funct\_1 \\ & X0 X2 \in k1\_funct\_1 X1 X2)))))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. ((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 \\ & X2 X0 X1) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 (k2\_zfmisc\_1 X0 X1)))))) \Rightarrow \\ & (((X1 = k1\_xboole\_0) \Rightarrow (X0 = k1\_xboole\_0)) \Rightarrow (X2 \in k1\_funct\_2 X0 X1)) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge (v4\_relat\_1 X1 X0)) \Rightarrow ( \\ & k1\_relset\_1 X0 X1 = k9\_xtuple\_0 X1) \end{aligned} \tag{3}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. ((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_funcop\_1 \\ & X0))) \Rightarrow ((v1\_relat\_1 (k1\_funct\_1 X0 X1)) \wedge (v1\_funct\_1 (k1\_funct\_1 \\ & X0 X1))) \end{aligned} \tag{4}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 \\ & X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & (\forall X3.(m2\_pboole X3 X0 X1 X2)\Rightarrow((v1\_relat\_1 X3)\wedge((v4\_relat\_1 \\ & X3 X0)\wedge((v1\_funct\_1 X3)\wedge(v1\_partfun1 X3 X0)))))) \end{aligned} \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 \\ & X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & ((v1\_relat\_1 (k7\_pboole X0 X1 X2))\wedge((v4\_relat\_1 (k7\_pboole X0 \\ & X1 X2) X0)\wedge((v1\_funct\_1 (k7\_pboole X0 X1 X2))\wedge(v1\_partfun1 (k7\_pboole \\ & X0 X1 X2) X0)))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 X0)\wedge( \\ & (v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\Rightarrow(\forall X2.((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & ((r1\_pzfmisc1 X0 X1 X2)\Rightarrow(k4\_autalg\_1 X0 X1 X2 = k4\_card\_3 (k7\_pboole \\ & X0 X1 X2)))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 X0)\wedge( \\ & (v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\Rightarrow(\forall X2.((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & ((r1\_pzfmisc1 X0 X1 X2)\Leftrightarrow(\forall X3.((X3 \in X0)\wedge(k1\_funct\_1 X2 X3 = \\ & k1\_xboole\_0))\Rightarrow(k1\_funct\_1 X1 X3 = k1\_xboole\_0)))))) \end{aligned} \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1 X1)\wedge(v4\_relat\_1 X1 X0))\Rightarrow( \quad (9)$$

$$(v1\_partfun1 X1 X0)\Leftrightarrow(k1\_relset\_1 X0 X1 = X0))$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 X0)\wedge( \\ & (v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\Rightarrow(\forall X2.((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & (\forall X3.((v1\_relat\_1 X3)\wedge((v4\_relat\_1 X3 X0)\wedge((v1\_funct\_1 \\ & X3)\wedge(v1\_partfun1 X3 X0))))\Rightarrow((X3 = k7\_pboole X0 X1 X2)\Leftrightarrow(\forall X4. \\ & (X4 \in X0)\Rightarrow(k1\_funct\_1 X3 X4 = k1\_funct\_2 (k1\_funct\_1 X1 X4) (k1\_funct\_1 \\ & X2 X4)))))) \end{aligned} \quad (10)$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge \\
& (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow (\forall X2. ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 X0)))) \Rightarrow \\
& (\forall X3. ((v1\_relat\_1 X3) \wedge ((v4\_relat\_1 X3 X0) \wedge ((v1\_funct\_1 \\
& X3) \wedge (v1\_partfun1 X3 X0)))) \Rightarrow ((m2\_pboole X3 X0 X1 X2) \Leftrightarrow (\forall X4. \\
& (X4 \in X0) \Rightarrow ((v1\_funct\_1 (k1\_funct\_1 X3 X4)) \wedge ((v1\_funct\_2 (k1\_funct\_1 \\
& X3 X4) (k1\_funct\_1 X1 X4) (k1\_funct\_1 X2 X4)) \wedge (m1\_subset\_1 (k1\_funct\_1 \\
& X3 X4) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (k1\_funct\_1 X1 X4) (k1\_funct\_1 \\
& X2 X4))))))))))
\end{aligned} \tag{11}$$

Assume the following.

$$\begin{aligned}
& \forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 \\
& X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))) \wedge ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 X0)))) \Rightarrow \\
& (\forall X3. (m2\_pboole X3 X0 X1 X2) \Rightarrow (v1\_funcop\_1 X3))
\end{aligned} \tag{12}$$

**Theorem 1**

$$\begin{aligned}
& \forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge \\
& (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow (\forall X2. ((v1\_relat\_1 \\
& X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 X0)))) \Rightarrow \\
& ((r1\_pzfmisc1 X0 X1 X2) \Rightarrow (\forall X3. (m2\_pboole X3 X0 X1 X2) \Rightarrow (X3 \in \\
& k4\_autalg\_1 X0 X1 X2)))
\end{aligned}$$