

# t84\_pboole (TM- FAAKUSk6oCyMyQcSEJ4xskiKBLm624i6x)

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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  $r6\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_pboole : \iota \Rightarrow \iota$  be given. Let  $k4\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_pboole : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Assume the following.

$$\forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow (r6\_pboole X0 (k4\_pboole X0 (k1\_pboole X0) X1) (k1\_pboole X0)) \quad (1)$$

Assume the following.

$$\forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow (r6\_pboole X0 (k4\_pboole X0 X1 (k1\_pboole X0)) X1) \quad (2)$$

Assume the following.

$$\forall X0. \forall X1. ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge (v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0))) \Rightarrow ((r6\_pboole X0 (k2\_pboole X0 X1 (k1\_pboole X0)) X1) \wedge (r6\_pboole X0 (k2\_pboole X0 (k1\_pboole X0) X1) X1)) \quad (3)$$

Assume the following.

$$\forall X0. \forall X1. \forall X2. (((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 X0) \wedge ((v1\_funct\_1 X1) \wedge (v1\_partfun1 X1 X0)))) \wedge ((v1\_relat\_1 X2) \wedge ((v4\_relat\_1 X2 X0) \wedge ((v1\_funct\_1 X2) \wedge (v1\_partfun1 X2 X0))))) \Rightarrow ((r6\_pboole X0 X1 X2) \Leftrightarrow (X1 = X2)) \quad (4)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 \\ & X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & ((v1\_relat\_1 (k4\_pboole X0 X1 X2))\wedge((v4\_relat\_1 (k4\_pboole X0 \\ & X1 X2) X0)\wedge((v1\_funct\_1 (k4\_pboole X0 X1 X2))\wedge(v1\_partfun1 (k4\_pboole \\ & X0 X1 X2) X0)))) \end{aligned} \tag{5}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.(((v1\_relat\_1 X1)\wedge((v4\_relat\_1 \\ & X1 X0)\wedge((v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0))))\wedge((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & ((v1\_relat\_1 (k2\_pboole X0 X1 X2))\wedge((v4\_relat\_1 (k2\_pboole X0 \\ & X1 X2) X0)\wedge((v1\_funct\_1 (k2\_pboole X0 X1 X2))\wedge(v1\_partfun1 (k2\_pboole \\ & X0 X1 X2) X0)))) \end{aligned} \tag{6}$$

Assume the following.

$$\forall X0.(v1\_relat\_1 (k1\_pboole X0)\wedge((v4\_relat\_1 (k1\_pboole X0) X0)\wedge((v1\_funct\_1 (k1\_pboole X0)\wedge(v1\_partfun1 (k1\_pboole X0) X0)))) \tag{7}$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 X0)\wedge \\ & (v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0)))\Rightarrow(\forall X2.((v1\_relat\_1 \\ & X2)\wedge((v4\_relat\_1 X2 X0)\wedge((v1\_funct\_1 X2)\wedge(v1\_partfun1 X2 X0))))\Rightarrow \\ & (k5\_pboole X0 X1 X2 = k2\_pboole X0 (k4\_pboole X0 X1 X2) (k4\_pboole \\ & X0 X2 X1)) \end{aligned} \tag{8}$$

**Theorem 1**

$$\forall X0.\forall X1.((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 X0)\wedge(v1\_funct\_1 X1)\wedge(v1\_partfun1 X1 X0)))\Rightarrow(r6\_pboole X0 (k5\_pboole X0 X1 (k1\_pboole X0)) X1)$$