

thm_2Ebool_2EBOOL__FUN__INDUCT
 (TMFdQxUKBaXr-
 rVCw5Cwtb97vEquWksoiZy6)

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Definition 1 We define $c_2Emin_2E_3D_3D_3E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p P \Rightarrow p Q)$ of type ι .

Definition 2 We define $c_2Emin_2E_3D$ to be $\lambda A.\lambda x \in A.\lambda y \in A.inj_o (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 3 We define c_2Ebool_2ET to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Definition 4 We define $c_2Ebool_2E_21$ to be $\lambda A.\lambda a : \iota.(\lambda V0P \in (2^{A-27a}).(ap (ap (c_2Emin_2E_3D (2^{A-27a}))$

Definition 5 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t)))$

Definition 6 We define c_2Ebool_2EF to be $(ap (c_2Ebool_2E_21 2) (\lambda V0t \in 2.V0t))$.

Definition 7 We define $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2EF$

Definition 8 We define $c_2Ebool_2E_5C_2F$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap (c_2Ebool_2E_21 2) (\lambda V2t \in 2.V2t)))$

Assume the following.

$$((\forall V0t \in 2.((\neg(\neg(p V0t))) \Leftrightarrow (p V0t))) \wedge (((\neg True) \Leftrightarrow False) \wedge ((\neg False) \Leftrightarrow True))) \quad (1)$$

Assume the following.

$$(\forall V0A \in 2.(\forall V1B \in 2.(((p V0A) \Rightarrow (p V1B)) \Leftrightarrow ((\neg(p V0A)) \vee (p V1B)))) \quad (2)$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(\forall V2t3 \in 2.(((p V0t1) \Rightarrow ((p V1t2) \Rightarrow (p V2t3))) \Leftrightarrow (((p V0t1) \wedge (p V1t2)) \Rightarrow (p V2t3)))))) \quad (3)$$

Assume the following.

$$(\forall V0f \in (2^2).((V0f = (\lambda V1b \in 2.c_2Ebool_2ET)) \vee ((V0f = (\lambda V2b \in 2.c_2Ebool_2EF)) \vee ((V0f = (\lambda V3b \in 2.V3b)) \vee (V0f = (\lambda V4b \in 2.(ap c_2Ebool_2E_7E V4b))))))) \quad (4)$$

Theorem 1

$$\begin{aligned} & (\forall V0P \in (2^{(2^2)}).((p (ap V0P (\lambda V1b \in 2.c.2Ebool.2ET)))) \wedge \\ & ((p (ap V0P (\lambda V2b \in 2.c.2Ebool.2EF))) \wedge ((p (ap V0P (\lambda V3b \in \\ & 2.V3b))) \wedge (p (ap V0P (\lambda V4b \in 2.(ap c.2Ebool.2E.7E V4b)))))) \Rightarrow \\ & (\forall V5f \in (2^2).(p (ap V0P V5f)))) \end{aligned}$$