thm_2EternaryComparisons_2Eordering__EQ__ordering (TM-LvRTnV7foKEJrErMjW5fENnzSSdBXM374)

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Let $ty\_2Enum\_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Enum\_2Enum \tag{1}$$

Let $ty\_2EternaryComparisons\_2Eordering : \iota$ be given. Assume the following.

$$nonempty\ ty\_2EternaryComparisons\_2Eordering \tag{2}$$

Let $c\_2EternaryComparisons\_2Eordering2num : \iota$ be given. Assume the following.

$$c\_2EternaryComparisons\_2Eordering2num \in (ty\_2Enum\_2Enum^{ty\_2EternaryComparisons\_2Eordering}) \tag{3}$$

Definition 1 *We define* $\mathsf{c\_2Emin\_2E\_3D}$ *to be* $\lambda A.\lambda x \in A.\lambda y \in A.inj\_\_o\ (x = y)$ *of type* $\iota \Rightarrow \iota$.

Definition 2 *We define* $\mathsf{c\_2Ebool\_2ET}$ *to be* $(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1$

Definition 3 *We define* $\mathsf{c\_2Ebool\_2E\_21}$ *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^{A\_27}$

Assume the following.

$$\forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0x \in A\_27a.(\forall V1y \in A\_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \tag{4}$$

Assume the following.

$$(\forall V0a \in ty\_2EternaryComparisons\_2Eordering.(\forall V1a\_27 \in ty\_2EternaryComparisons\_2Eordering.(((ap\ c\_2EternaryComparisons\_2Eordering2num\ V0a) = (ap\ c\_2EternaryComparisons\_2Eordering2num\ V1a\_27)) \Leftrightarrow (V0a = V1a\_27)))) \tag{5}$$

Theorem 1

$$(\forall V0a \in ty\_2EternaryComparisons\_2Eordering.(\forall V1a\_27 \in ty\_2EternaryComparisons\_2Eordering.((V0a = V1a\_27) \Leftrightarrow ((ap\ c\_2EternaryComparisons\_2Eordering2\ V0a) = (ap\ c\_2EternaryComparisons\_2Eordering2num\ V1a\_27)))))$$