$$D_{0b} = \;\;\times\;\; CZ^{2b}$$

$$b \in \mathbb{Z}_3$$

Def 3: $\times \;:=\;$ H • H • H •
 H • H • H •

C_7: (1) $\;\;\bullet\!-\!S \;=\; S\!-\!\bullet\;\;$ (2) $\;\;\bullet / S \;=\; S / \bullet$

R_{18}: (1) $\;\;S\!\times\; =\; \times\!S\;\;$ (2) $\;\;\times / S \;=\; S / \times$

Lem 11 By Def 3, C_7 & R_{18}, 19.

(1) $\;\;S - D_{00} \;=\; D_{00} - S$

(2) $\;\;S - D_{01} \;=\; D_{01} - S$

(3) $\;\;S - D_{02} \;=\; D_{02} - S$

Proof: 19.(1)/(2)/(3). LHS $:=$ $S - D_{0b} \;=\; \boxed{S \times} CZ^{2b}$

$\underset{R_{18}}{=\!=}$ $\times \boxed{S\; CZ^{2b}}$

$\underset{C_7}{=\!=}$ $\times \boxed{CZ^{2b}} S$

$\underset{\text{def}}{=\!=}$ $D_{0b} - S \;=\;$ 19.(1)/(2)/(3). RHS. ▰

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D_{ab} $=$

$a \neq 0$

Def 3: $\times$ $:=$ H—•—H—•—H—•
                        H—•—H—•—H—•

C7: (1) $=$ **(2)** $=$

R18: (1) $=$ **(2)** $=$

Lem 12 By Def 3, C_7 & R_{18},

19 . (4) $\;\; S - D_{10} = D_{10} - S$ (7) $\;\; S - D_{20} = D_{20} - S$

(5) $\;\; S - D_{11} = D_{11} - S$ (8) $\;\; S - D_{21} = D_{21} - S$

(6) $\;\; S - D_{12} = D_{12} - S$ (9) $\;\; S - D_{22} = D_{22} - S$

Proof: 19 . (4)–(9) . LHS $:=$ $S - D_{ab} =$ [with A_{ab}, S, crossing, and controls]

$\overset{R_{18}}{=\!=}$ [with A_{ab}, crossing, S, controls]

$\overset{C_7}{=\!=}$ [with A_{ab}, crossing, controls, S]

$\overset{def}{=\!=}$ $D_{ab} - S$ $= 19 . (4)–(9) . RHS.$

▨

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