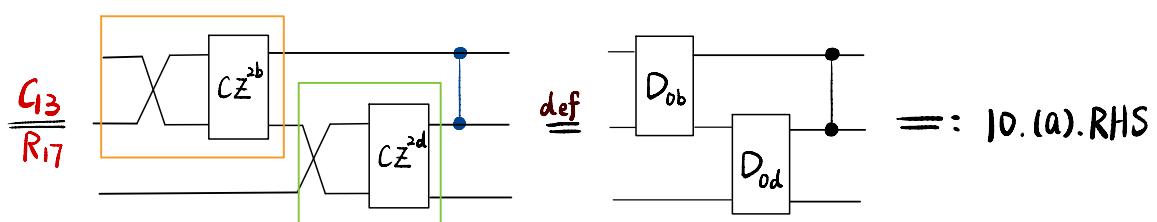
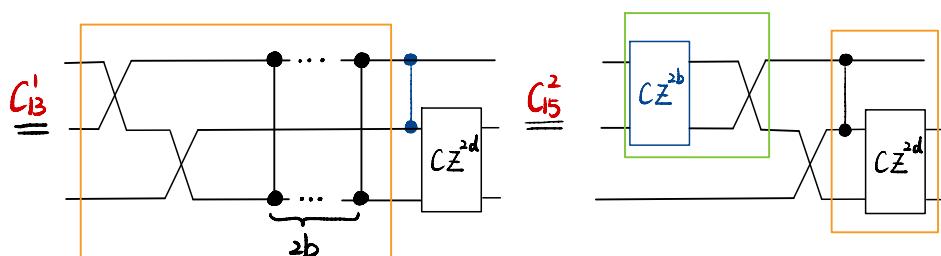
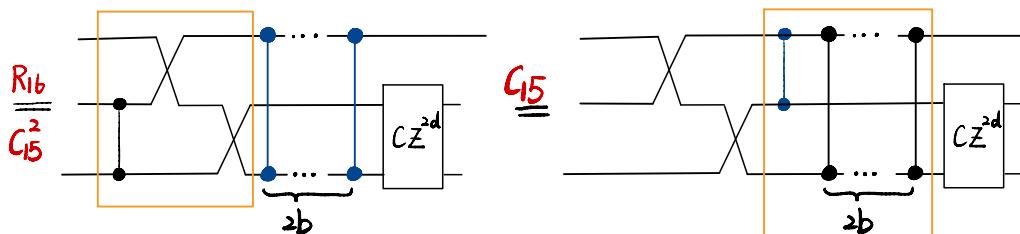
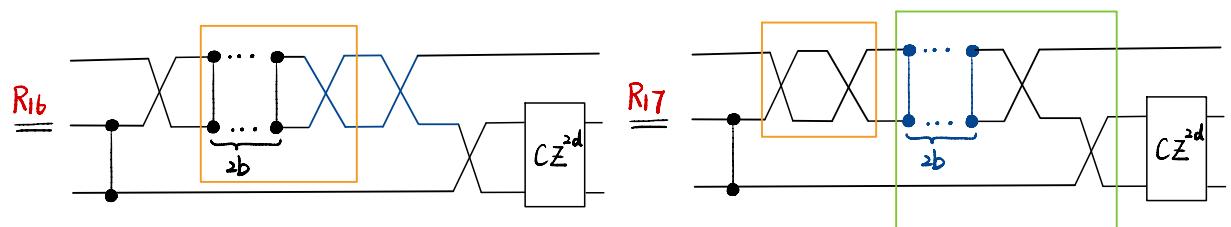
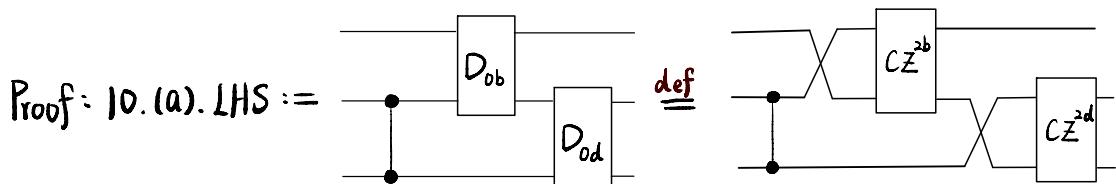
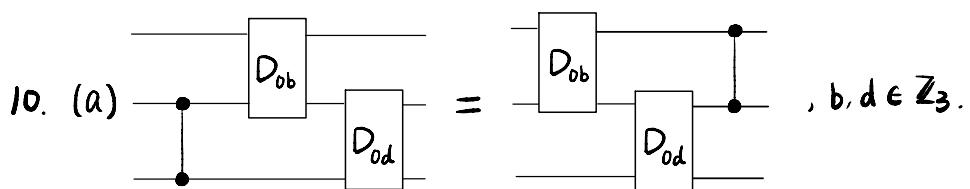
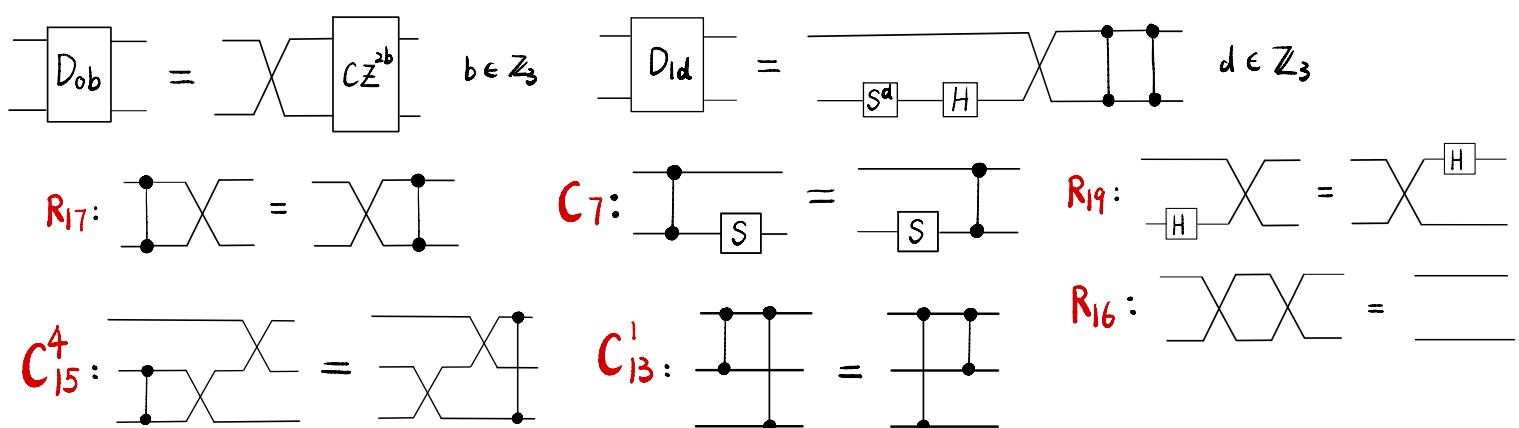
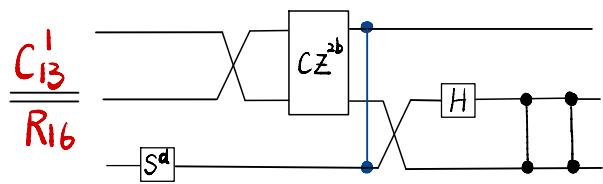
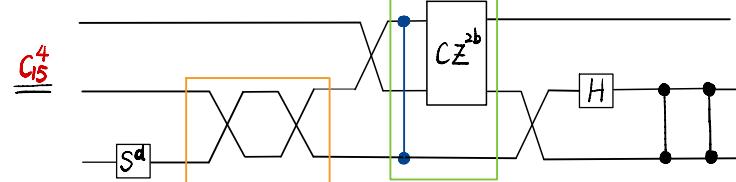
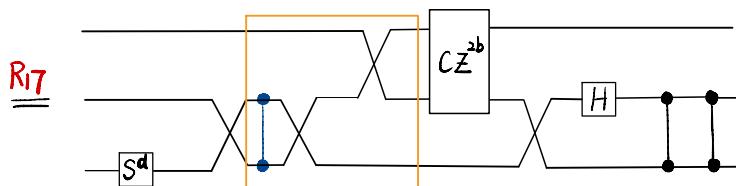
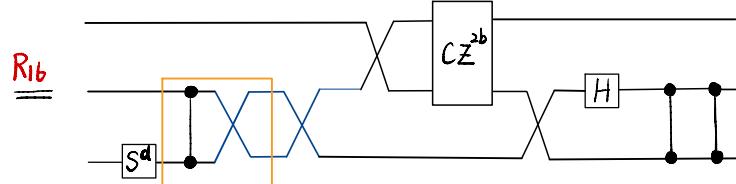
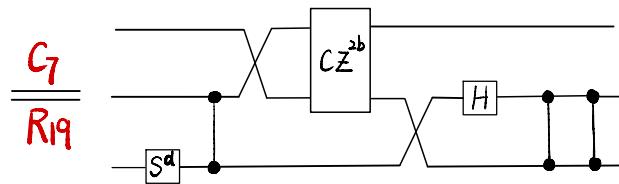
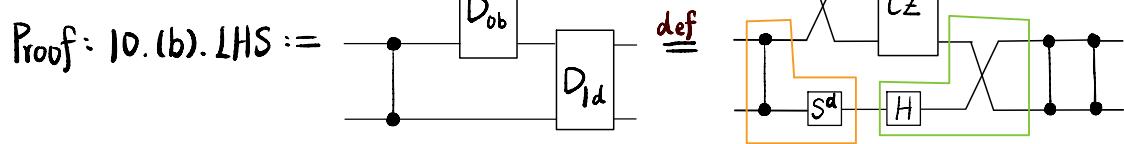
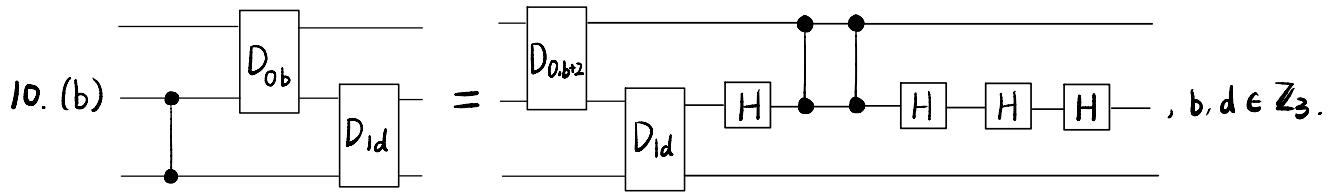


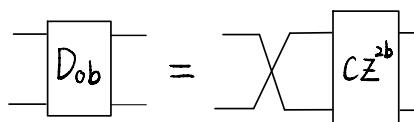
Lem 1  $R_{16}, R_{17}, C_{13}^1$  &  $C_{15}^1$  imply



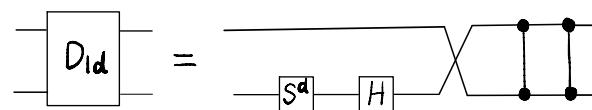


Lem 2 Def 4-5, C<sub>2-3</sub>, C<sub>6-7</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>19</sub>, R<sub>39</sub>, C<sub>13</sub> & C<sub>15</sub> imply





$b \in \mathbb{Z}_3$



$d \in \mathbb{Z}_3$

**Def4:**

$C2: H^4 = I$

**R19:**

**C5**:

**R17**:

**R16**:

**Lem 2 10. (b)**
 $, b, d \in \mathbb{Z}_3.$

**Proof cont:**

**10. (b). LHS** = 
R16

**C5**  
**R17**

**R16**

**10. (b). RHS** :=

**def**
 $2(b+2) = 2b + 1$

**Def4**

**R19**

$$C_2 : H^4 = I$$

$$C_6 : \text{Diagram} = \text{Diagram}$$

$$R_{16} : \text{Diagram} = \text{Diagram}$$

$$C_3 : S^3 = I$$

$$R_{17} : \text{Diagram} = \text{Diagram}$$

$$C_{15}^2 : \text{Diagram} = \text{Diagram}$$

$$R_{39} : \text{Diagram} = \text{Diagram} \quad \text{Def 5: } \text{Diagram} := \text{Diagram}$$

Lem 2

$$10. (b) \text{Diagram} = \text{Diagram}, b, d \in \mathbb{Z}_3.$$

Proof cont:

$$10. (b). \text{RHS} = \text{Diagram}$$

$$\stackrel{R_{16}}{=} \text{Diagram}$$

$$\stackrel{C_{15}^2}{\stackrel{R_{17}}{=}} \text{Diagram}$$

$$\stackrel{R_{16}}{=} \text{Diagram}$$

$$\text{Hence} \quad \text{Diagram} \stackrel{\text{WTS}}{=} \text{Diagram}$$

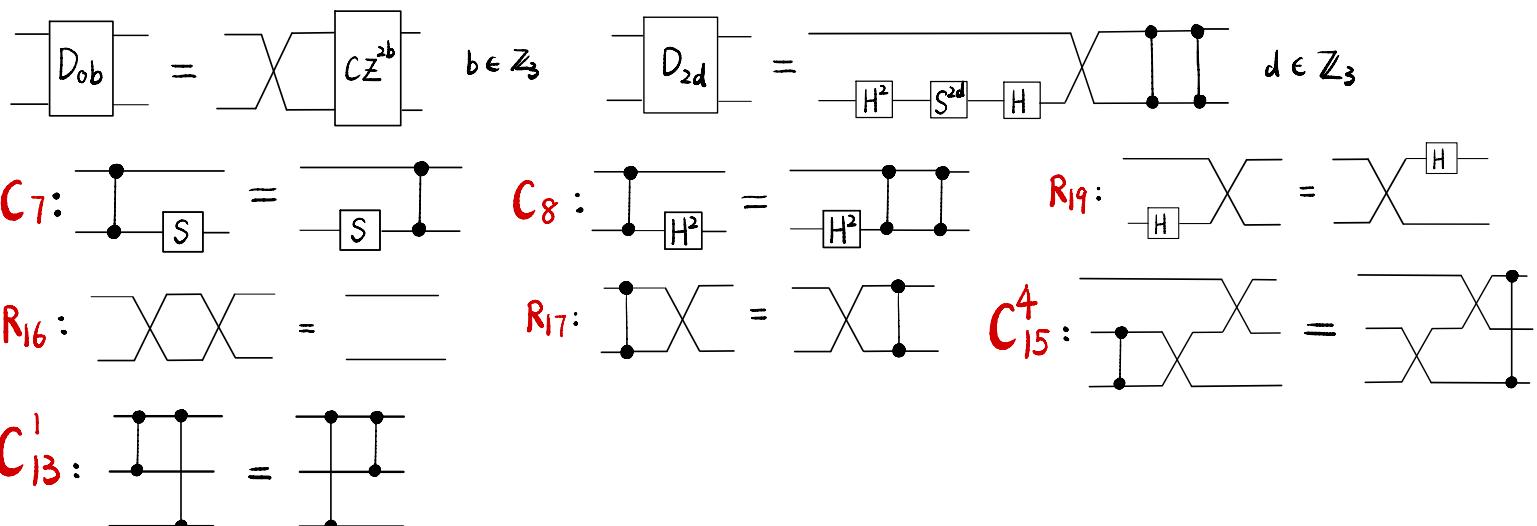
$$C_3, C_6 \parallel R_{16}$$

$$\text{Diagram} \stackrel{\text{WTS}}{=} \text{Diagram}$$

$$\stackrel{\text{Def 5}}{=} \text{Diagram}$$

$$\text{Diagram}$$

By  $R_{39}$ , this completes the proof.



Lem3 Def 4-5, C<sub>2-3</sub>, C<sub>6-8</sub>, R<sub>16</sub>, R<sub>17</sub>, R<sub>19</sub>, R<sub>40</sub>, C<sub>13</sub> & C<sub>15</sub> imply

10. (c)  $D_{ob} D_{2d} = D_{ob+1} D_{2d} H H H H$ ,  $b, d \in \mathbb{Z}_3$ .

