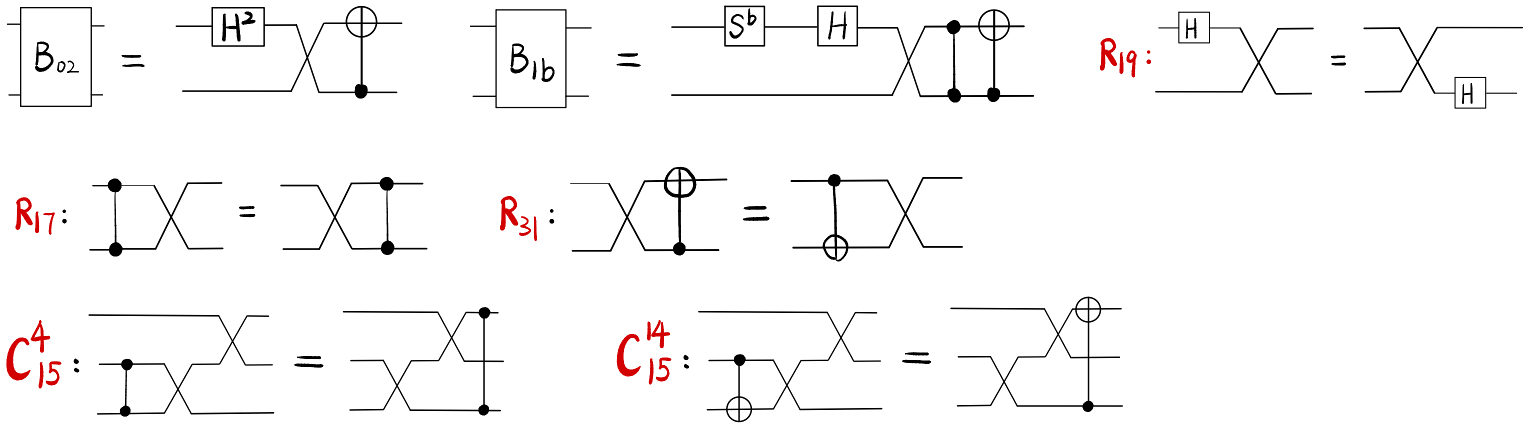
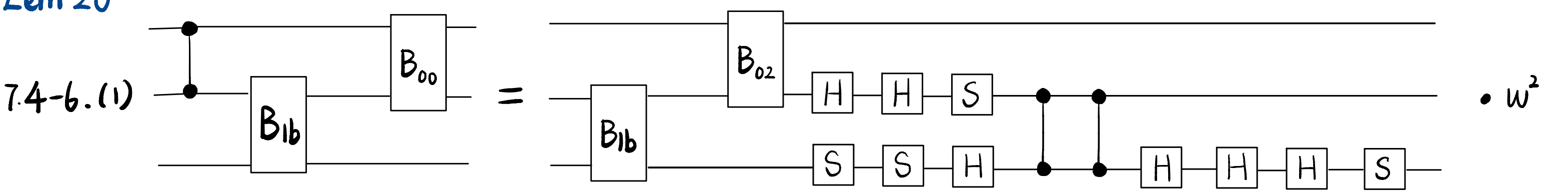
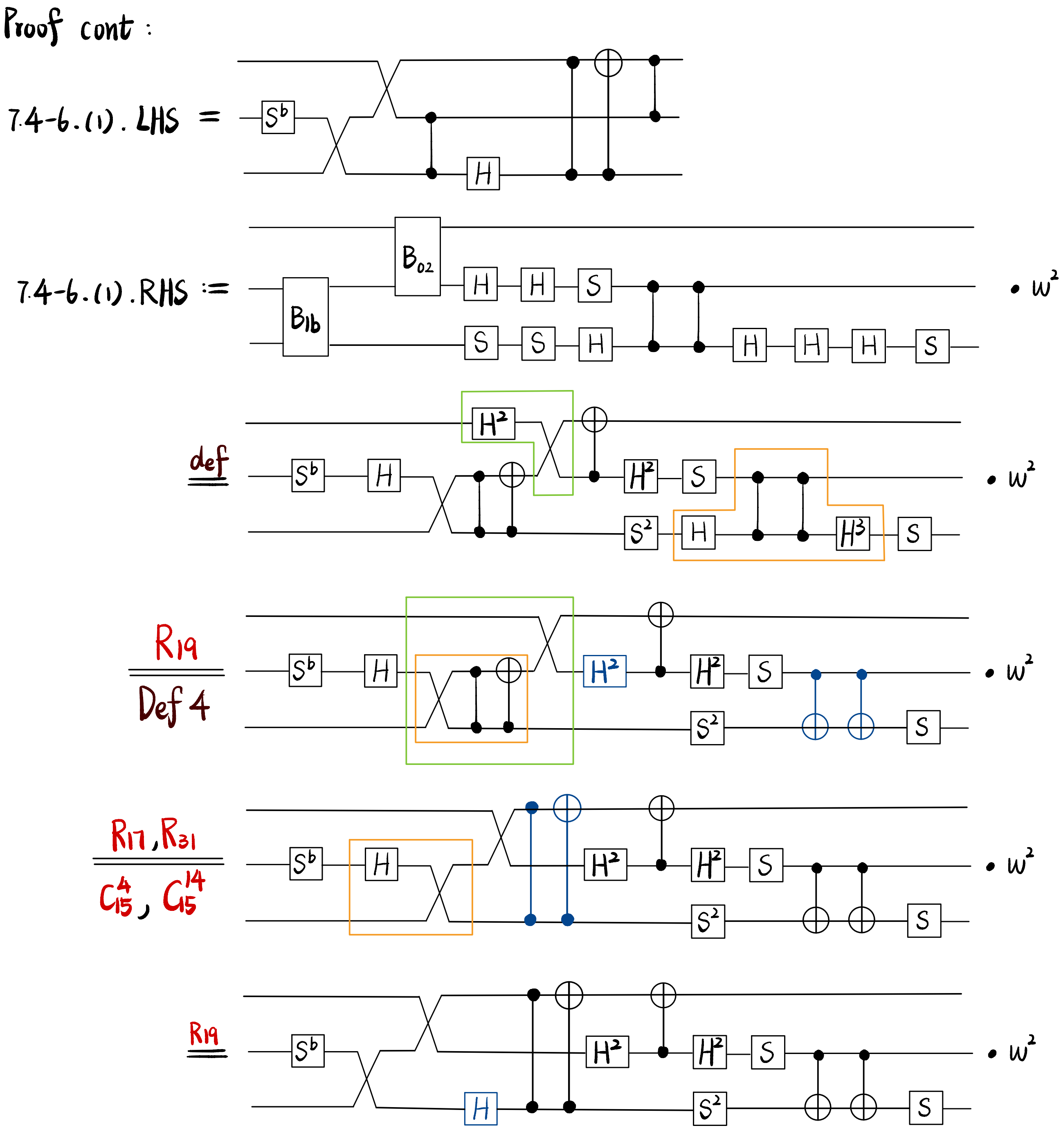



Lem 20

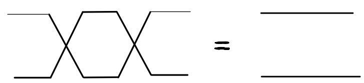



Proof cont :

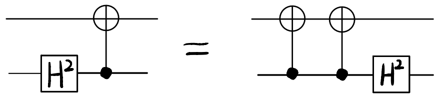


$C_3 : S^3 = I$

$R_{16}$ :

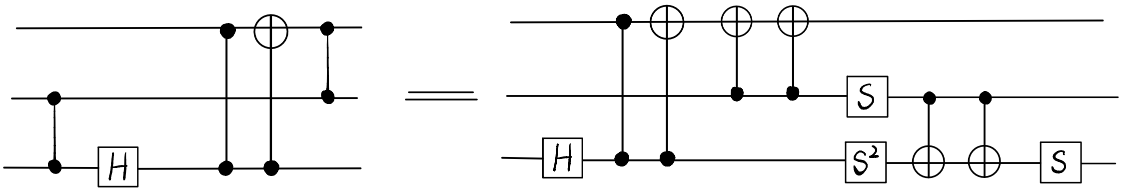


$C_8^6$ :




$C_2 : H^4 = I$

$R_{53}$ :




$\cdot\, \omega^2$

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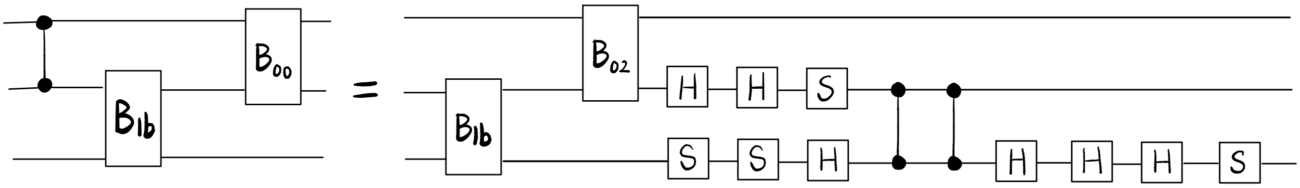
**Lem 20**

7.4-6.(1)




$\cdot\, \omega^2$

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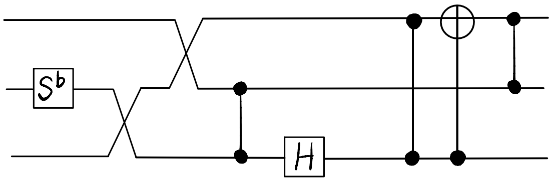
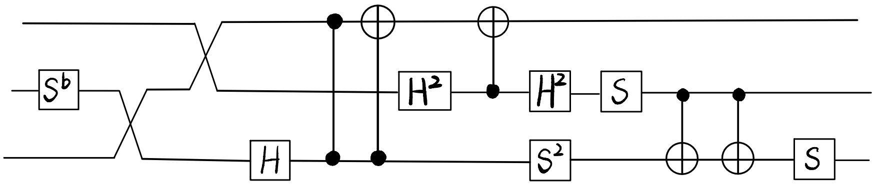
Proof cont : Hence

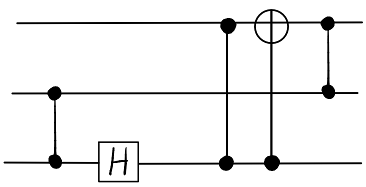



WTS $=$

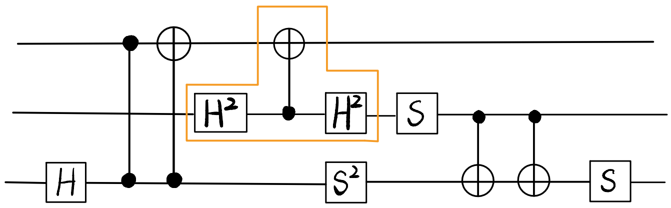



$\cdot\, \omega^2$

$C_3 \equiv R_{16}$

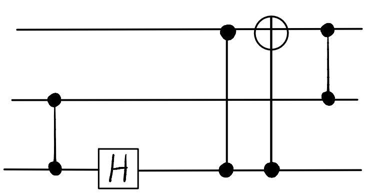



WTS $=$

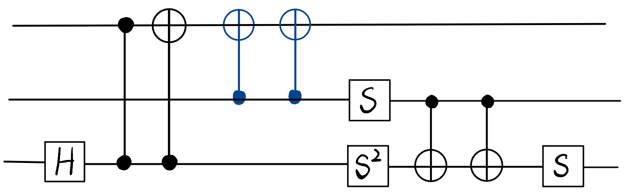



$\cdot\, \omega^2$

$C_2 \equiv C_8^6$

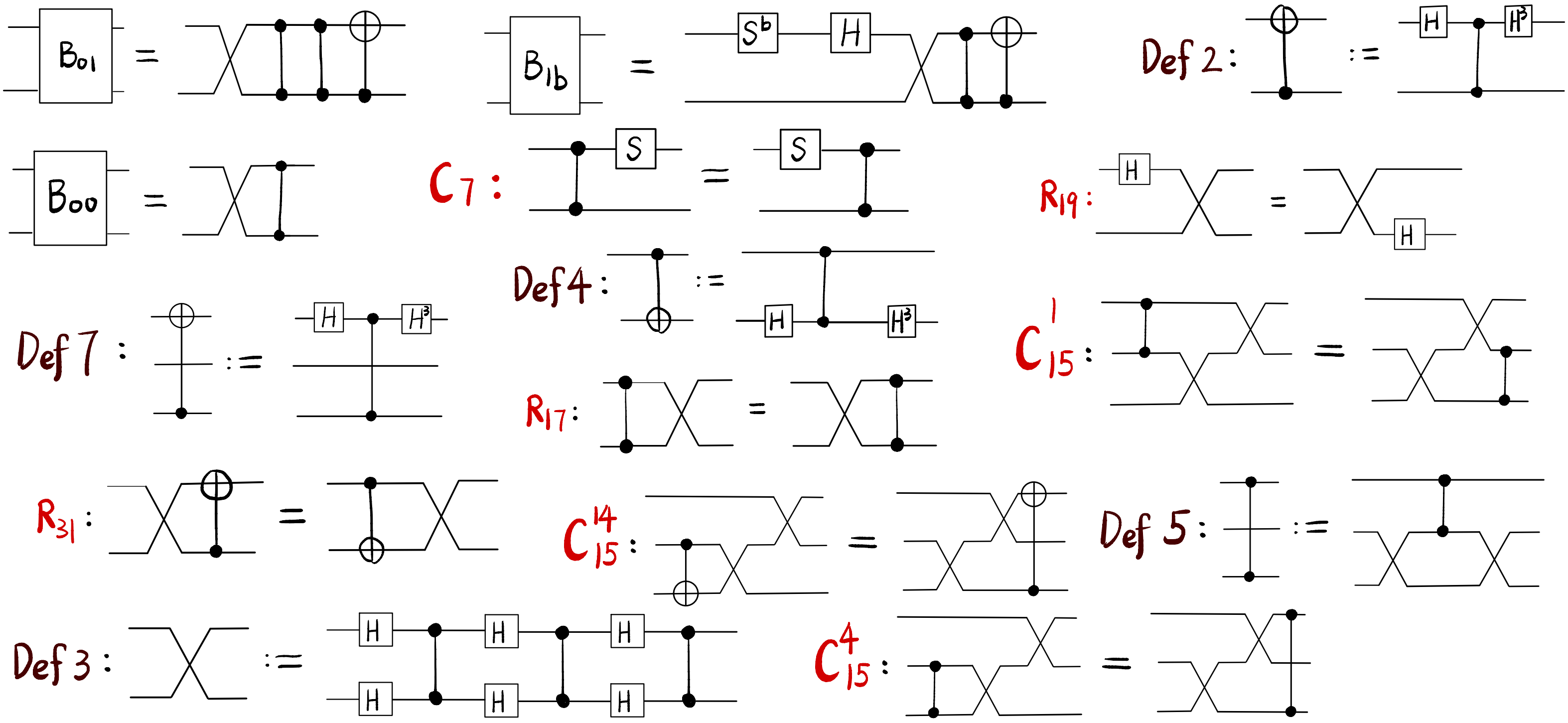



WTS $=$



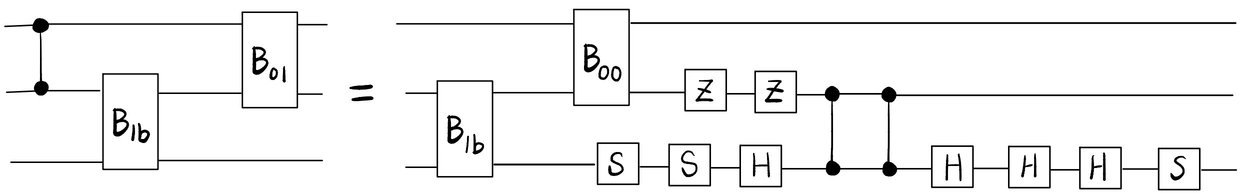

$\cdot\, \omega^2$

By $R_{53}$, this completes the proof. ∎

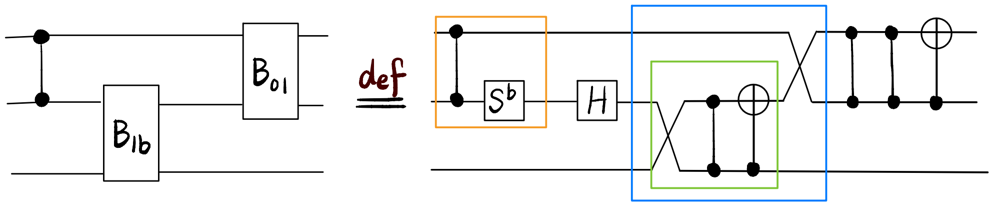



Lem 21 Def 2-5, Def 7, $C_3$, $C_7$, $C_{15}$, $R_{16}$, $R_{17}$, $R_{19}$, $R_{31}$ & $R_{54}$ imply

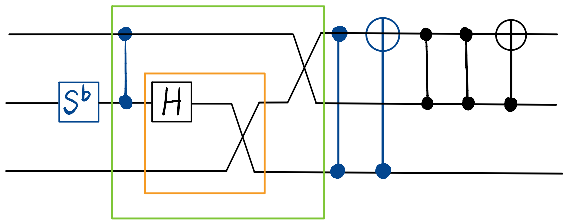
7.4-6.(2)



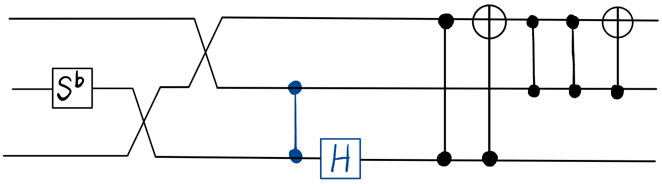

Proof: 7.4-6.(2). LHS :=



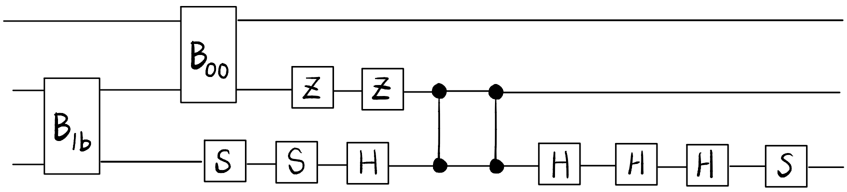

$\overline{\overline{C_7, R_{17}, R_{31}}}$
$C_{15}^4$, $C_{15}^{14}$



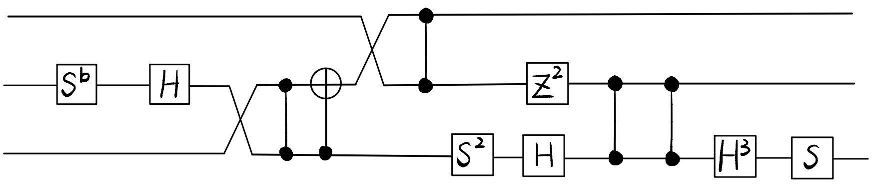

$\overline{\overline{R_{19}}}$
$C_{15}^1$

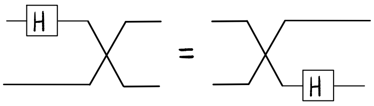


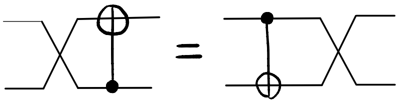

7.4-6.(2). RHS :=

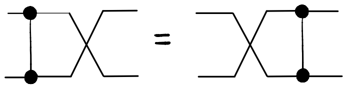


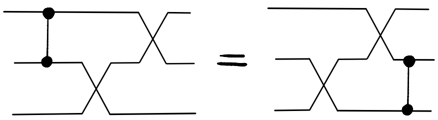

def

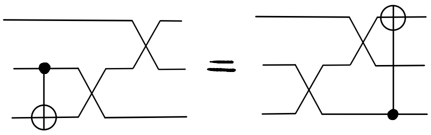


$R_{19}$:


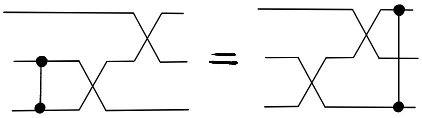
$R_{31}$:


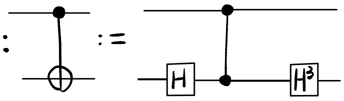
$R_{17}$:


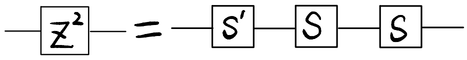
$C^1_{15}$:


$C^{14}_{15}$:


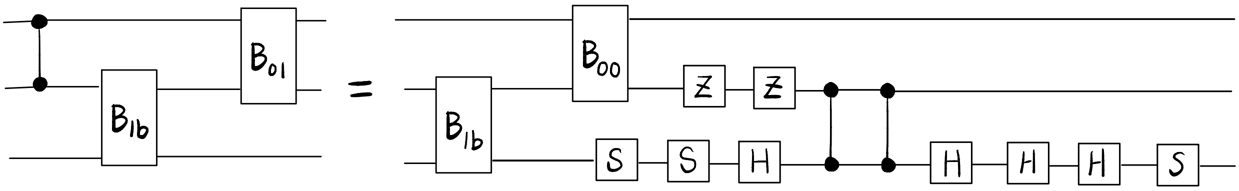
$C2: H^4 = I$

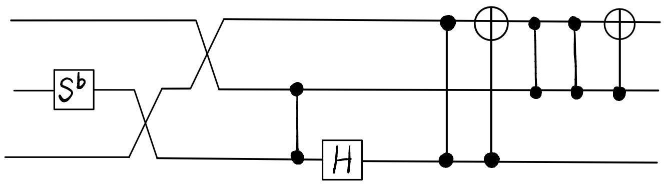
$C^4_{15}$:


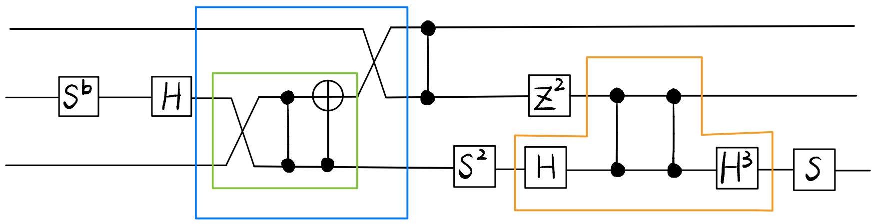
Def4:


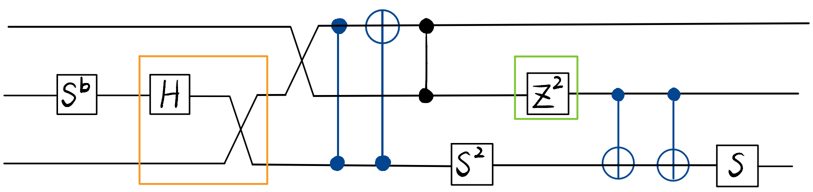
R11:


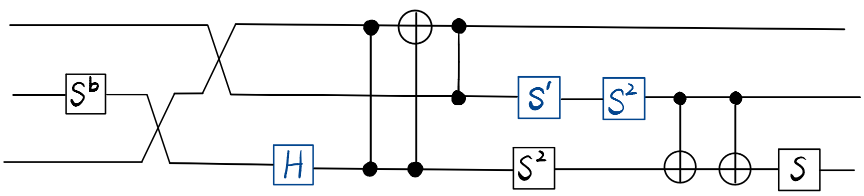
## Lem 21

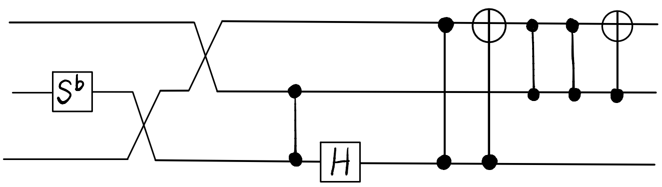
7.4-6.(2)


Proof cont: 7.4-6.(2). LHS =


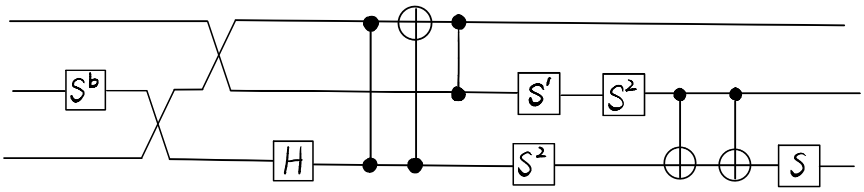
7.4-6.(2). RHS =


$\dfrac{C_2, R_{17}, R_{31}}{C^4_{15}, C^{14}_{15}, \text{Def4}}$


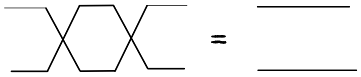
$\dfrac{R_{19}}{R_{11}}$


Hence


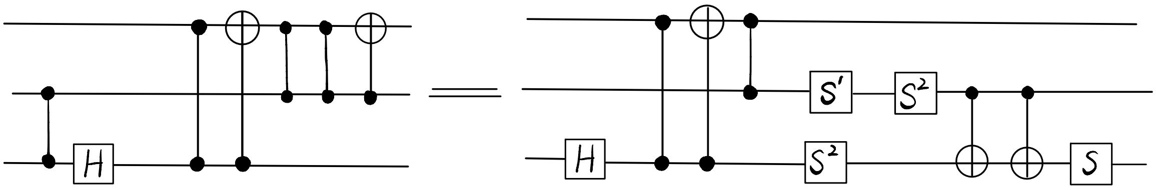
WTS



$C_3 : S^3 = I$ $R_{16}$ :

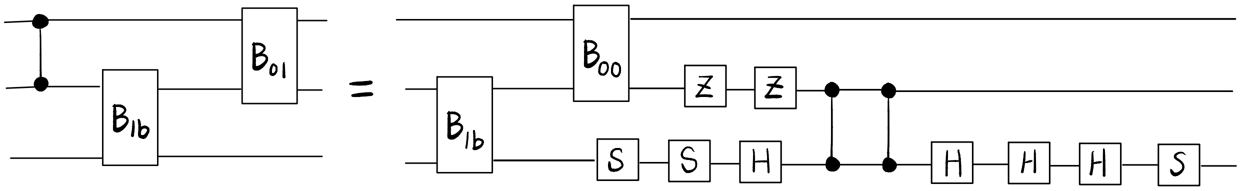


$R_{54}$:

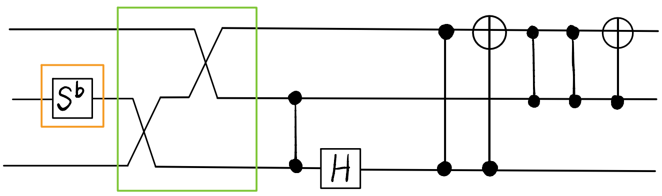



Lem 21

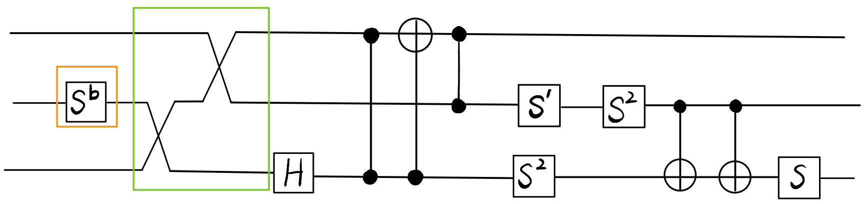
7.4-6.(2)



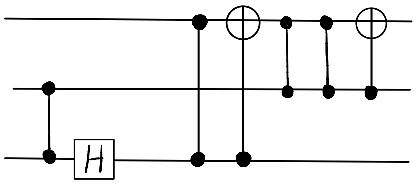

Proof cont :



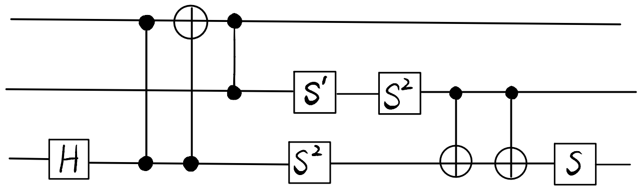

WTS =



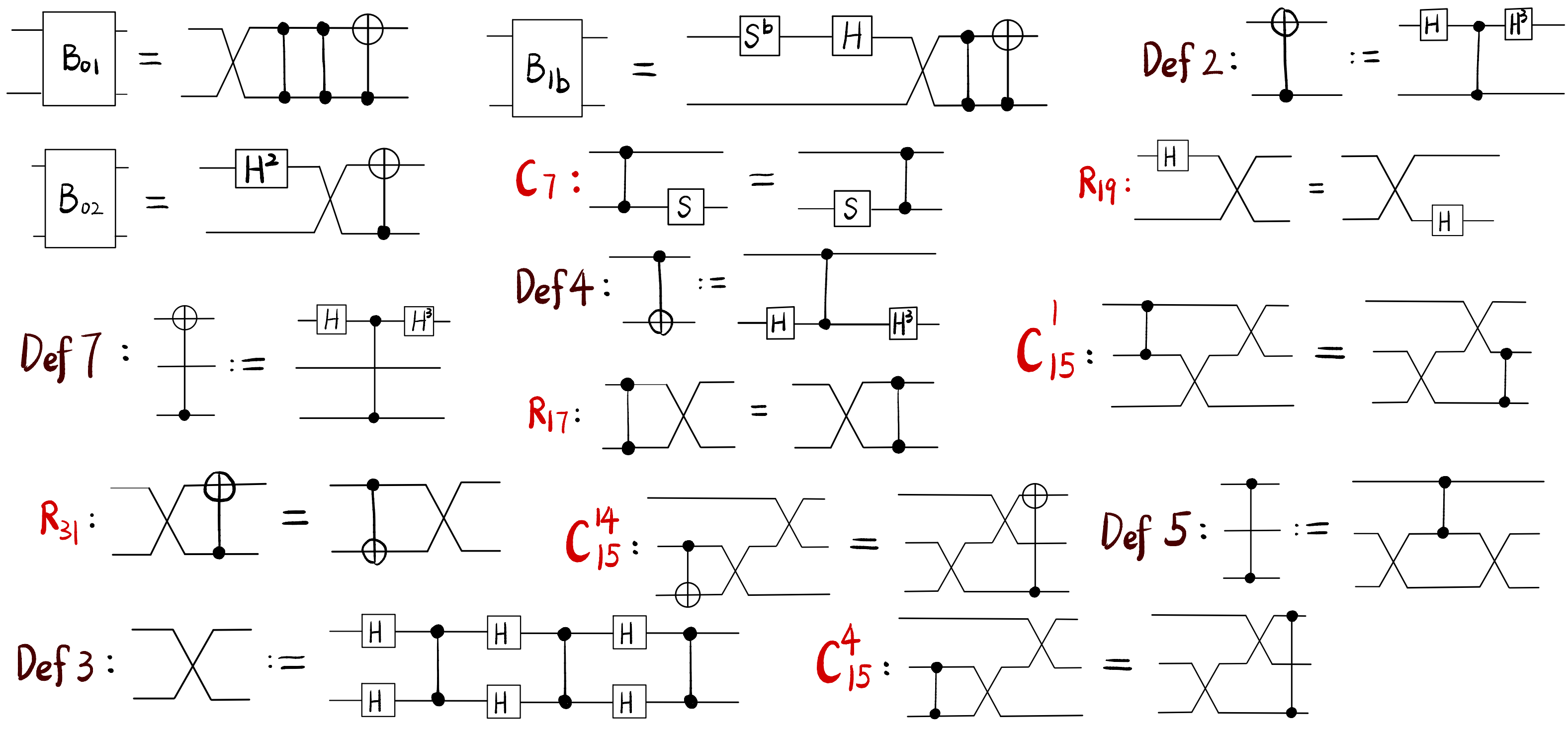

$C_3 \,|||\, R_{16}$




WTS =

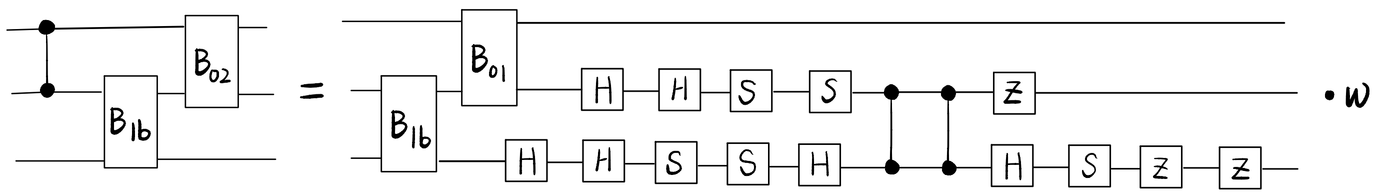



By $R_{54}$, this completes the proof. ◻

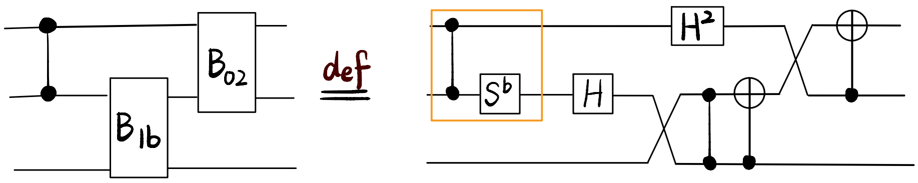


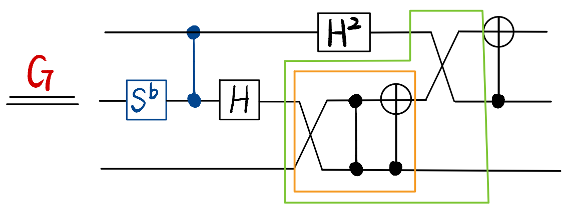

Lem 22 Def 1-5, Def 7, $C_3$, $C_5$, $C_7$, $C_{15}$, $R_{10}$, $R_{11}$, $R_{16}$, $R_{17}$, $R_{19}$, $R_{31}$ & $R_{55}$ imply

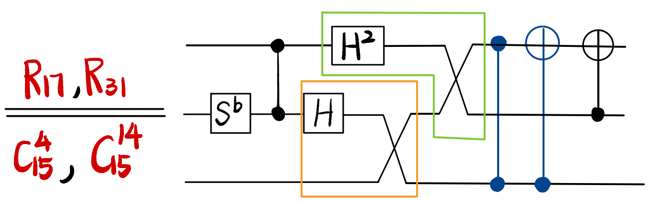
7.4-6.(3)

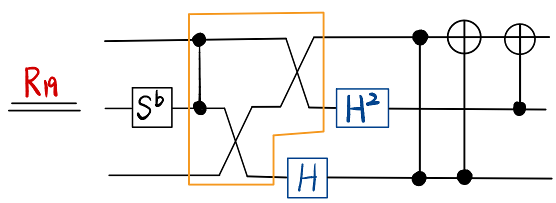


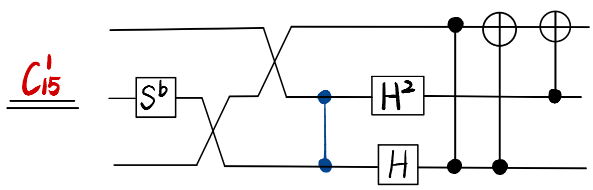

Proof : 7.4-6.(3). LHS :=

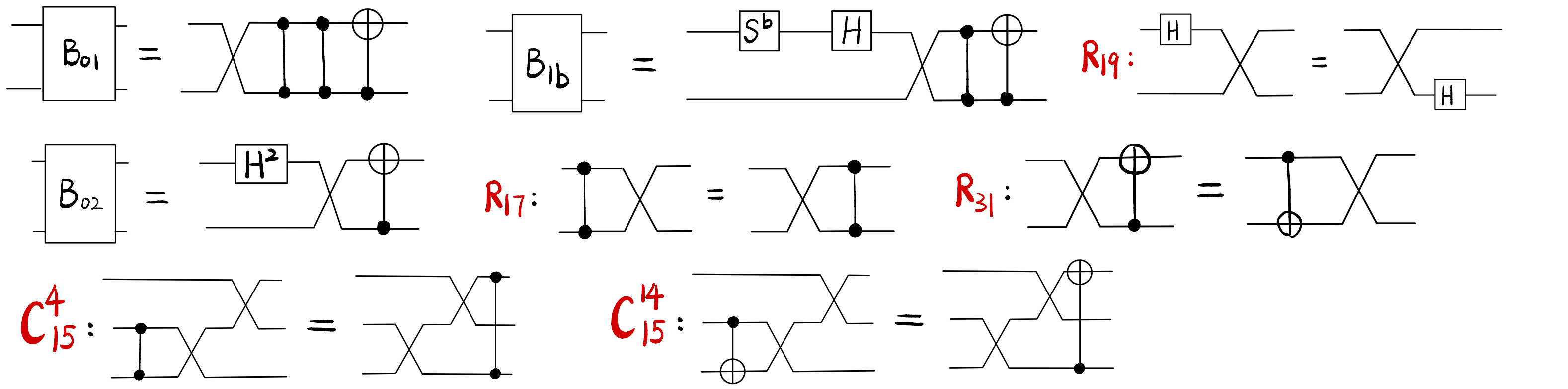


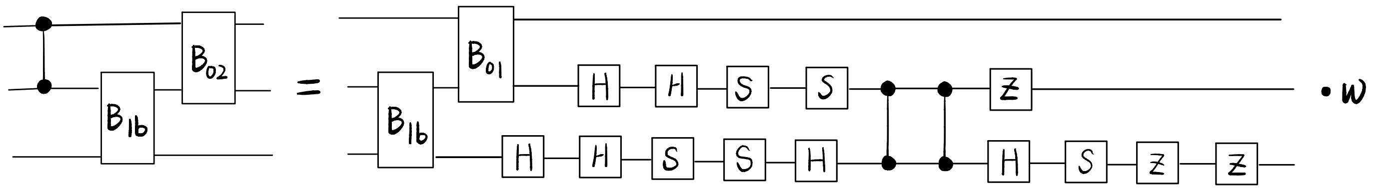





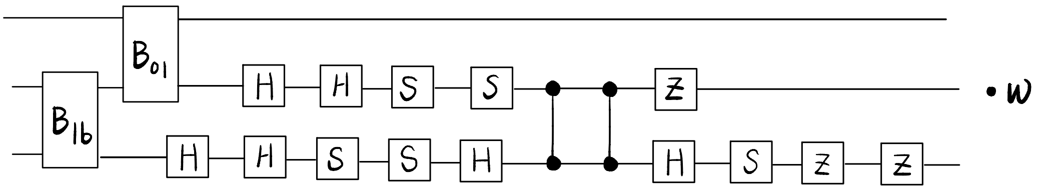

## Lem 22

7.4-6.(3)

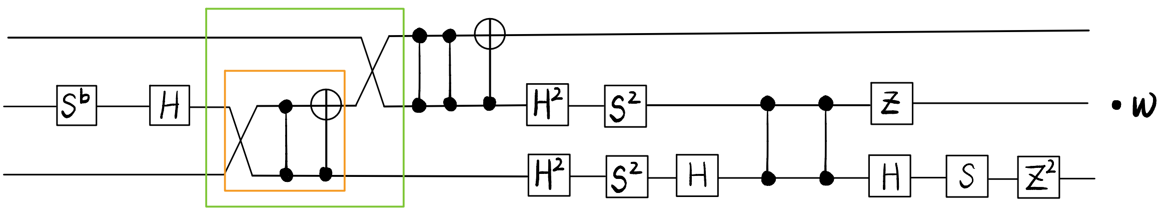



Proof cont :

7.4-6.(3). RHS :=

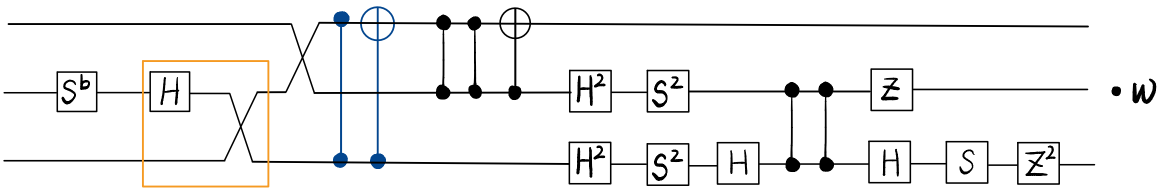



def

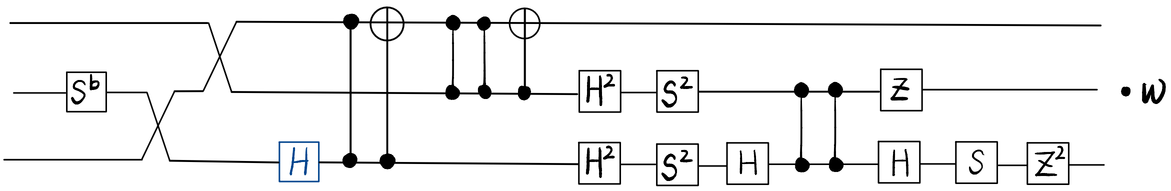



$R_{17}, R_{31}$

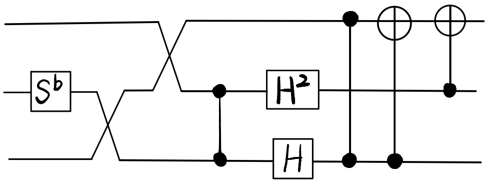
$C^4_{15}, C^{14}_{15}$




$R_{19}$




Hence




WTS