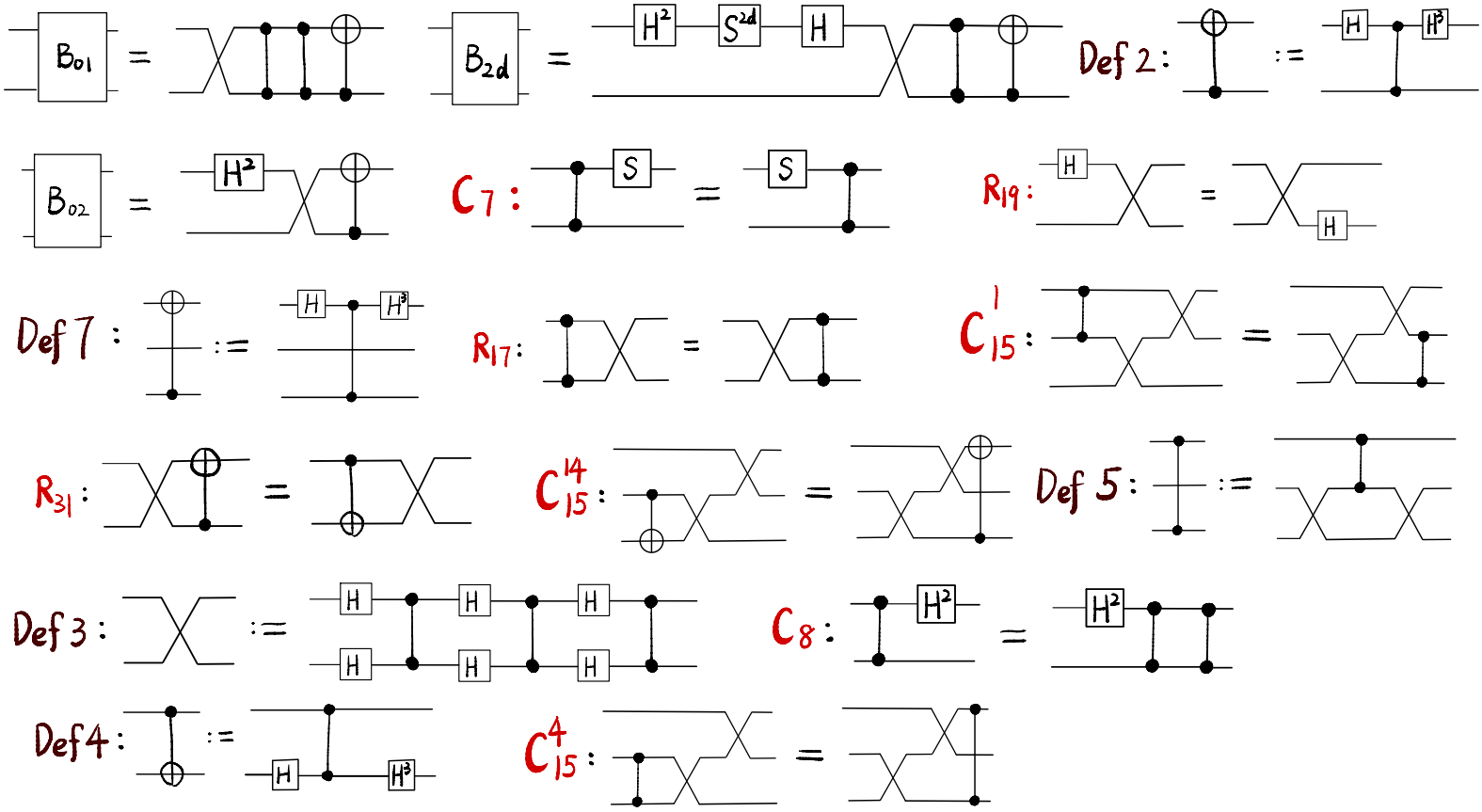
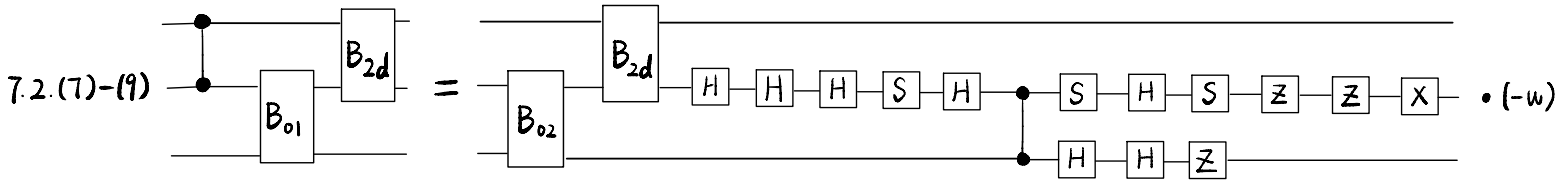
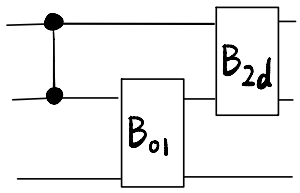


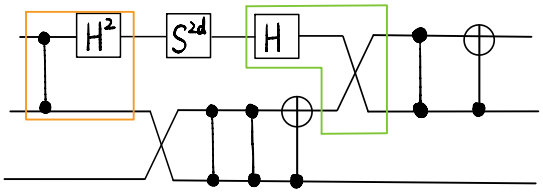
Lem 18 Def 1-5, Def 7, C_3, C_7, C_8, C_{15}, R_5, R_{10}, R_{11}, R_{16}, R_{17}, R_{19}, R_{31} & R_{51} imply



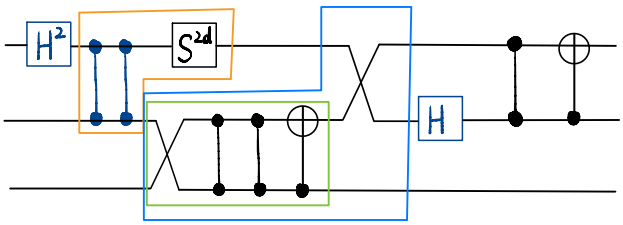
Proof : 7.2.(7)-(9). LHS :=



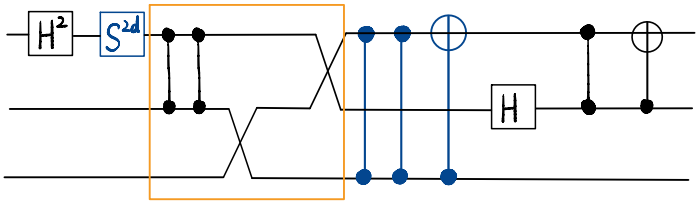
def



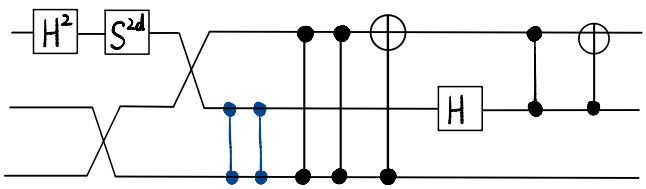
C_8 / R_{19}

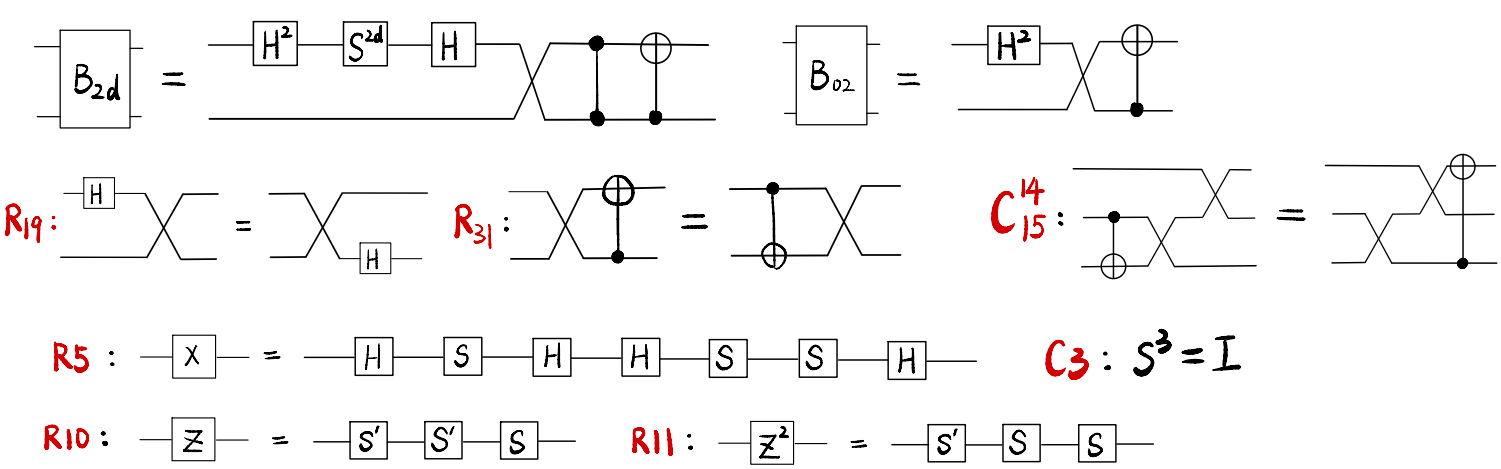


C_7, R_{17}, R_{31} / C_{15}^{4}, C_{15}^{14}



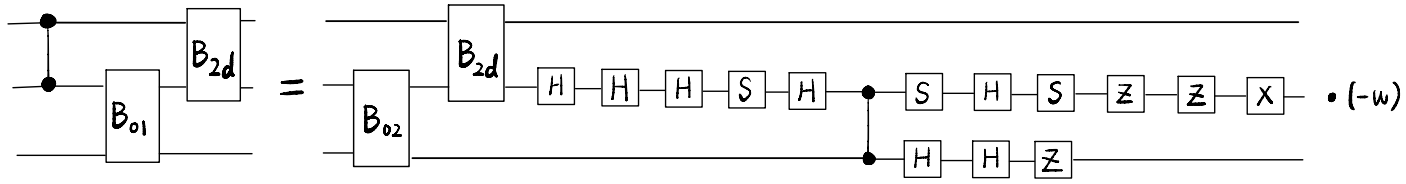
C_{15}^{1}





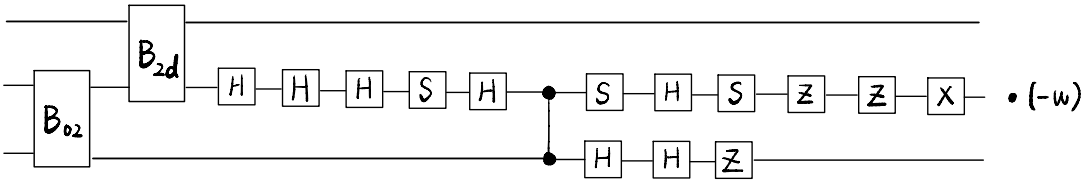
Lem 18

7.2.(7)-(9)

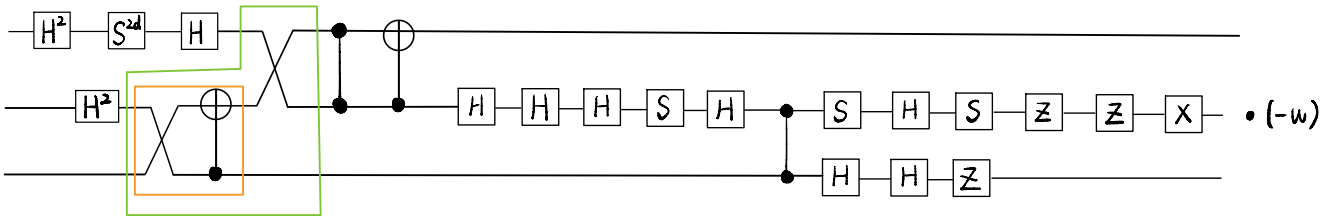


Proof cont :

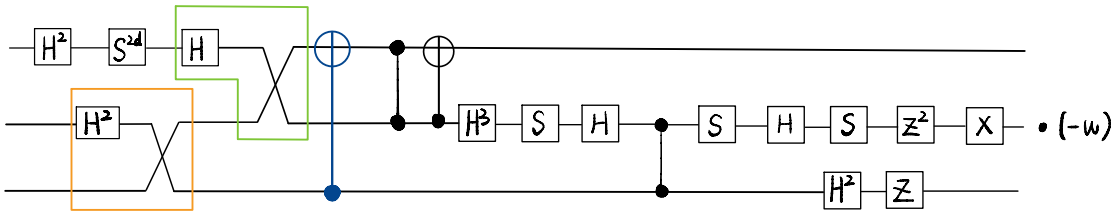
7.2.(7)-(9).RHS :=



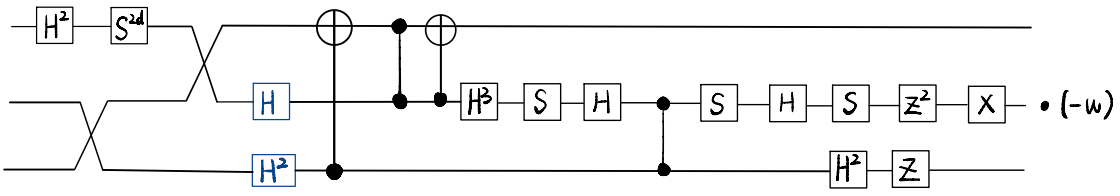
def



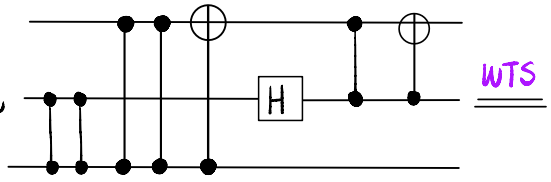
R_{31} / C_{15}^{14}



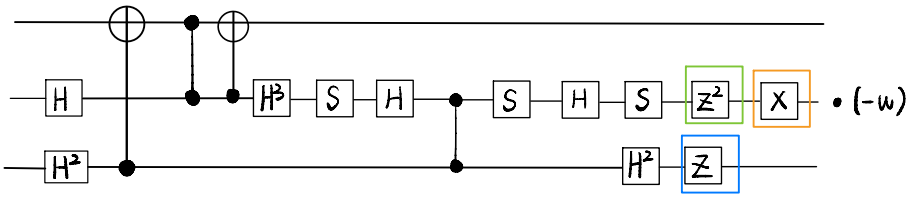
R_{19}



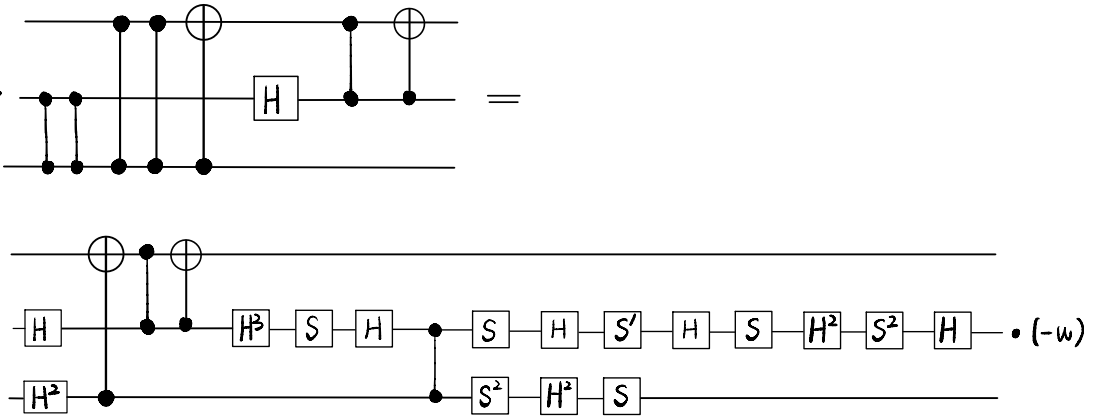
Hence,



WTS

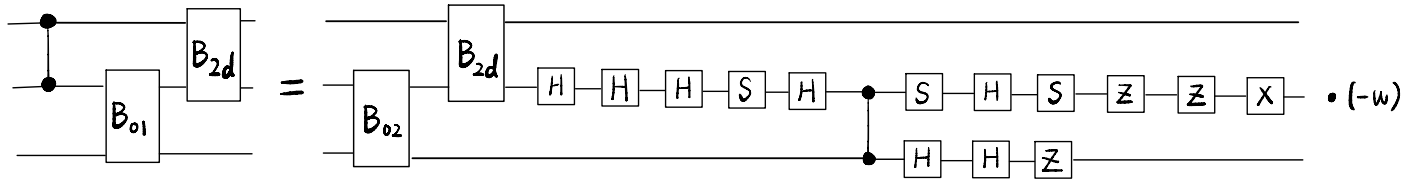


R_{51} :

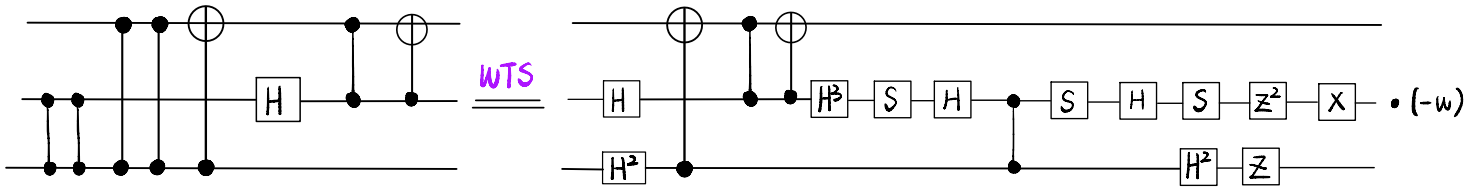


Lem 18

7.2.(7)-(9)



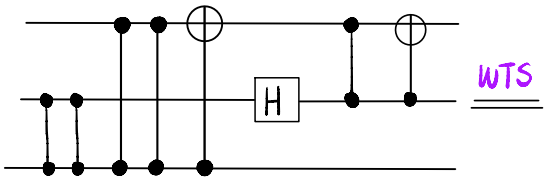
Proof cont :

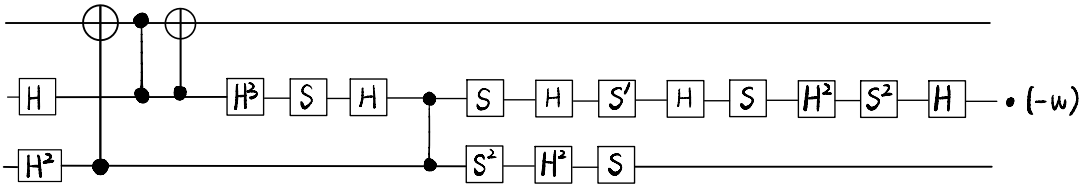


C_2, C_3, Def 1 $|||$ R_5, R_{10}, R_{11}

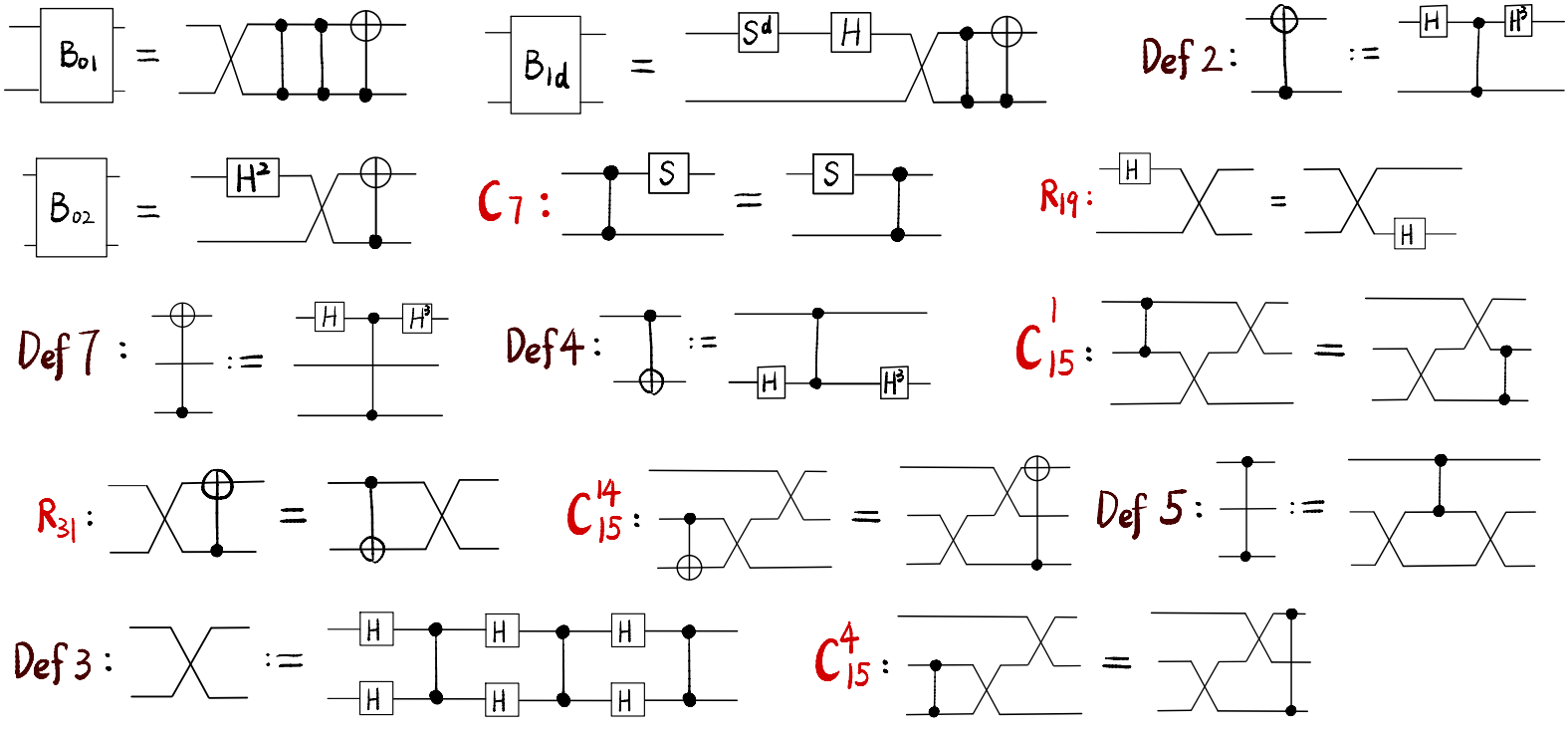
$$SHSZ^2X \overset{R_{11}}{\underset{R_5}{=}} SHSS'S^2HSH^2S^2H \overset{C_3}{=} SHS'HSH^2S^2H$$

$$H^2Z \overset{R_{10}}{=} H^2S'S'S \overset{\text{Def 1}}{=} H^2H^2S^2H^2S \overset{C_2}{=} S^2H^2S$$

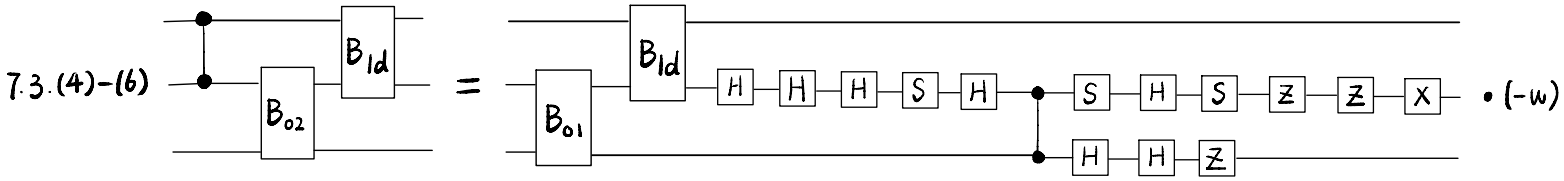




By R_{51}, this completes the proof.



Lem 19 Def 1-5, Def 7, C_3, C_7, C_8, C_{15}, R_5, R_{10}, R_{11}, R_{16}, R_{17}, R_{19}, R_{31} & R_{52} imply

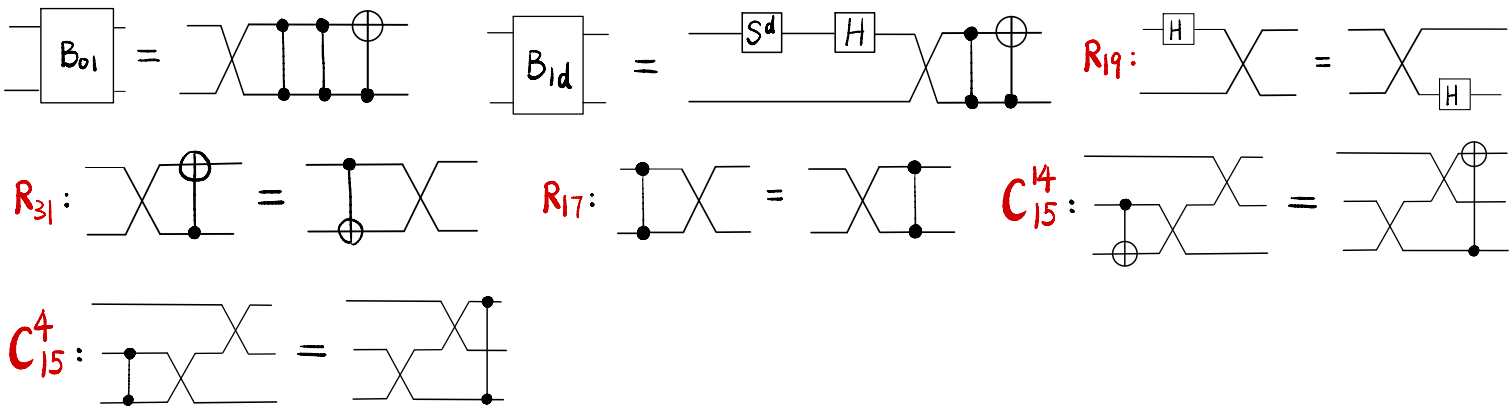


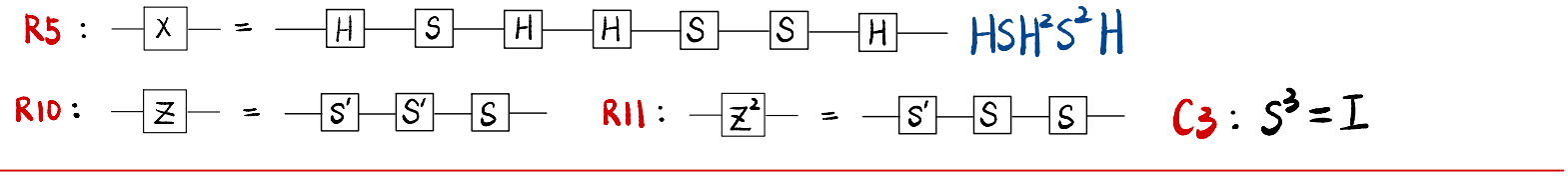
Proof: 7.3.(4)-(6). LHS := B_{02} B_{1d} def S^d H H^2

R_{31}, C_7 / C_{15}^{14} S^d H H^2

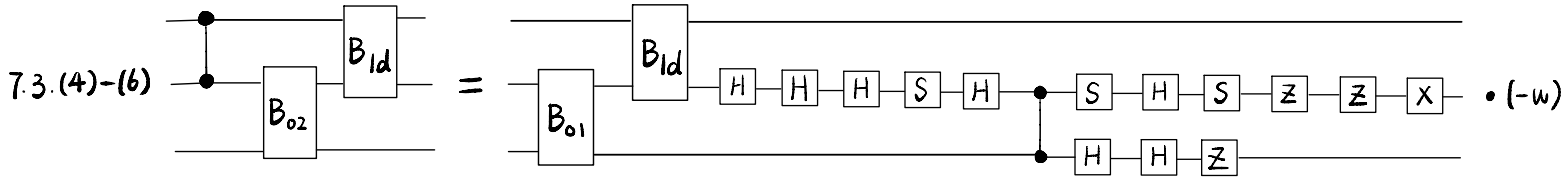
R_{19} S^d H H^2

C_{15}^{1} S^d H H^2



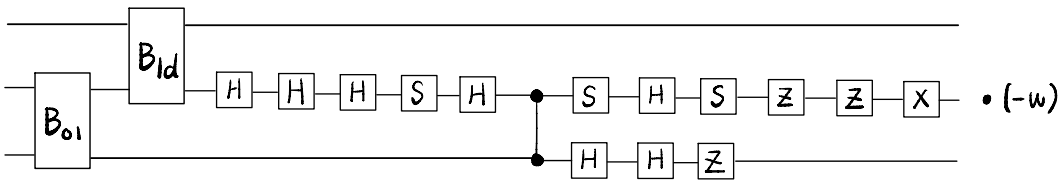


Lem 19

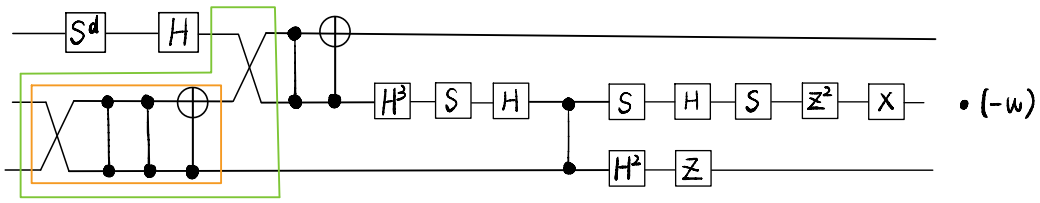


Proof cont :

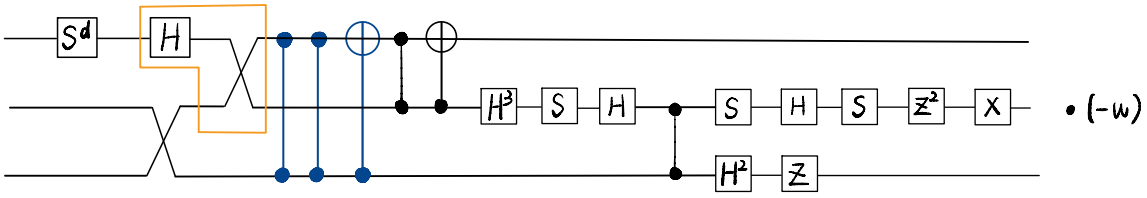
7.3.(4)-(6) . RHS :=



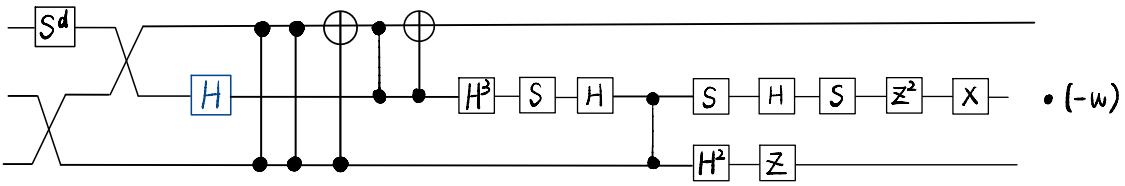
def



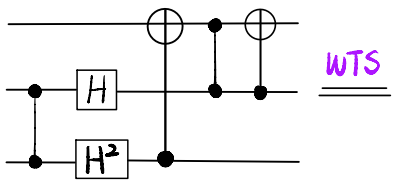
R_{17}, R_{31} / C^4_{15}, C^{14}_{15}



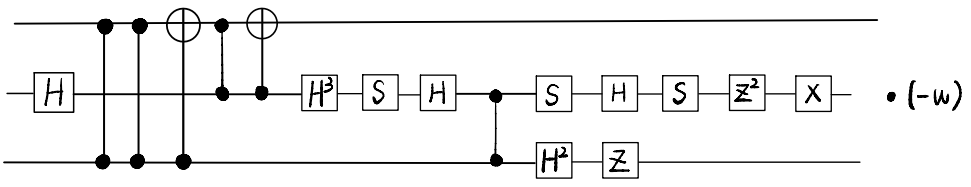
R_{19}



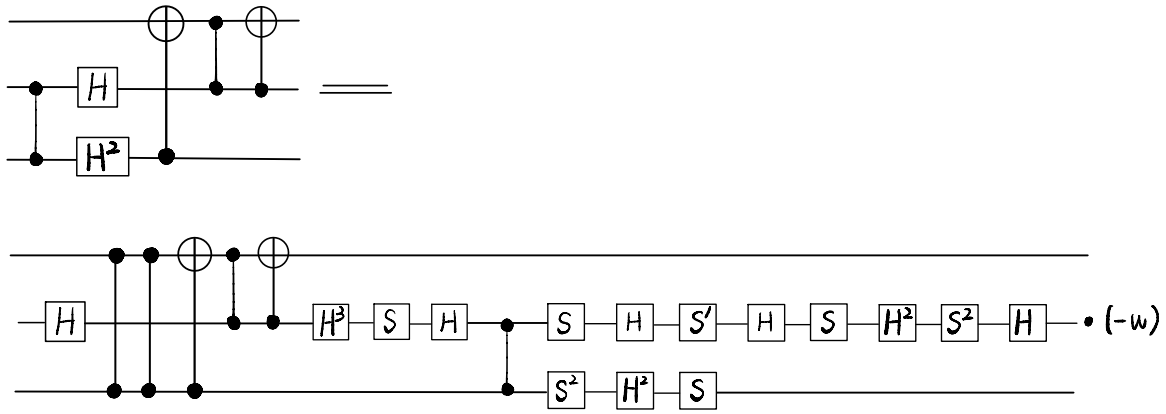
Hence



WTS

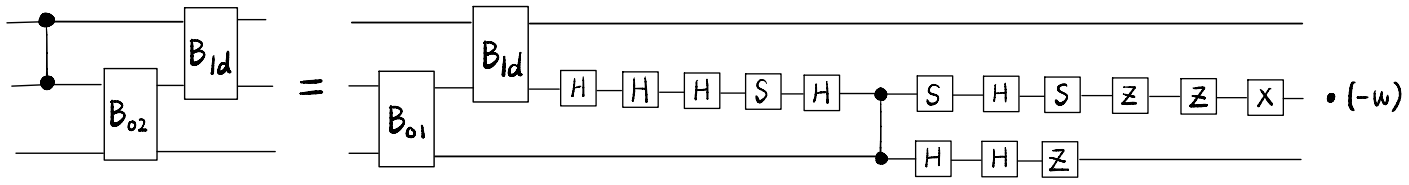


R_{52}:

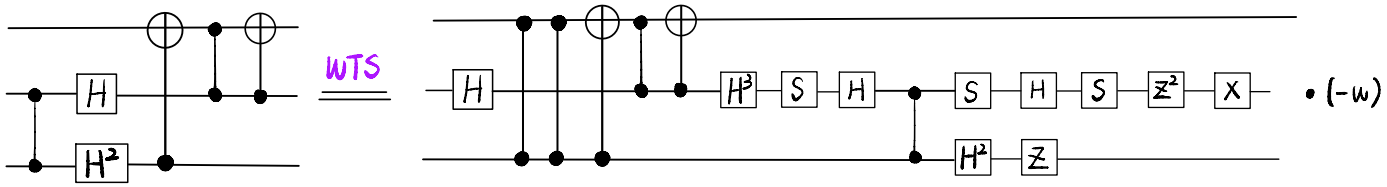


Lem 19

7.3.(4)-(6)



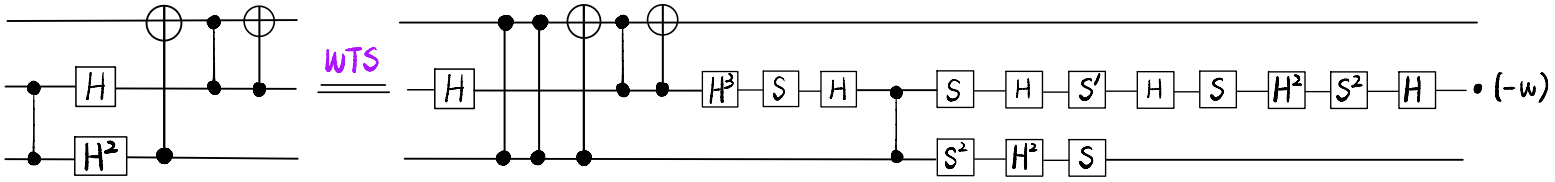
Proof cont:



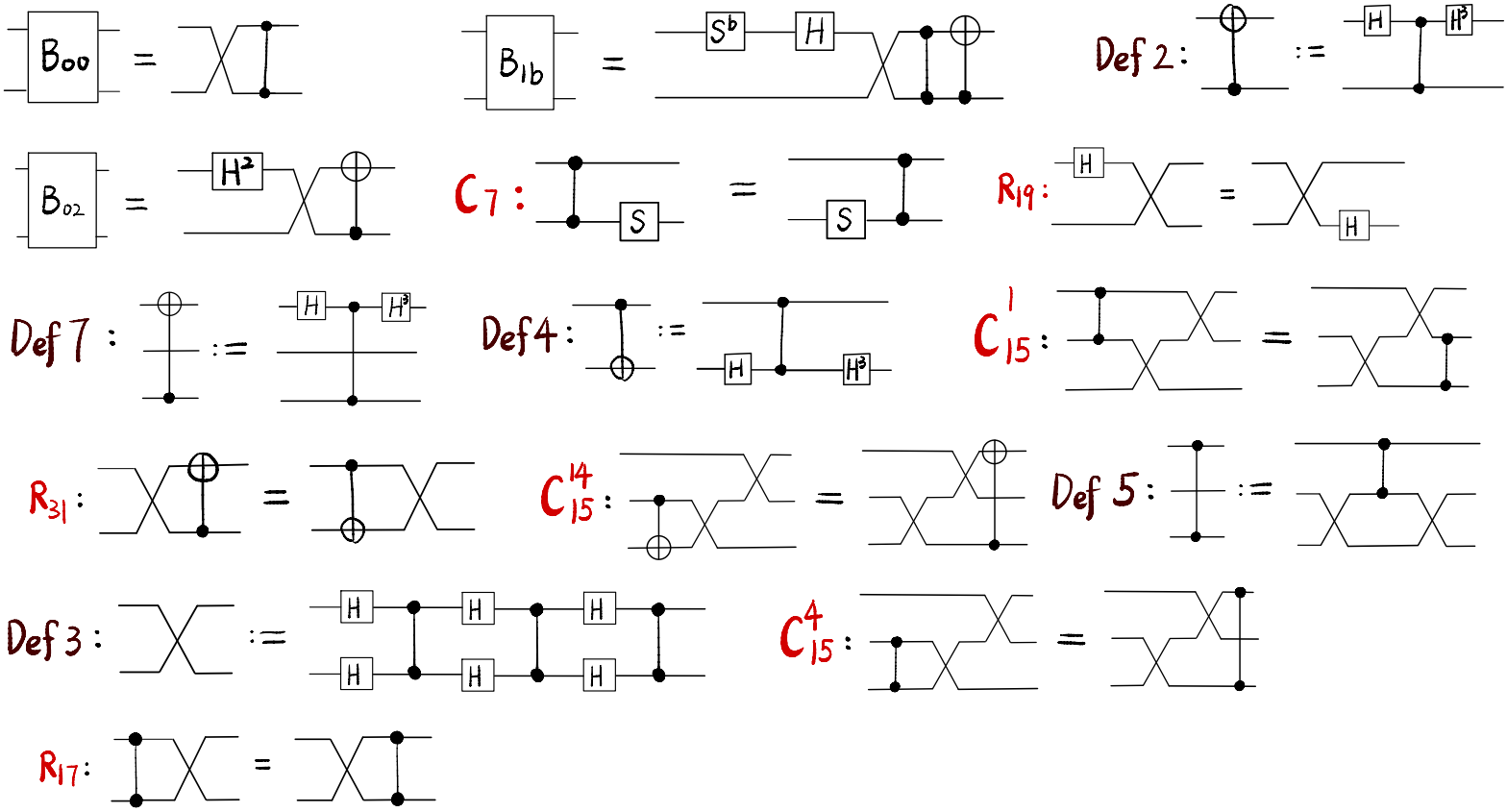
C_2, C_3, Def 1 $\Vert\Vert$ R_5, R_{10}, R_{11}

$SHSZ^2X \overset{R_{11}}{\underset{R_5}{=}} SHSS'S^2HSH^2S^2H \overset{C_3}{=} SHS'HSH^2S^2H$

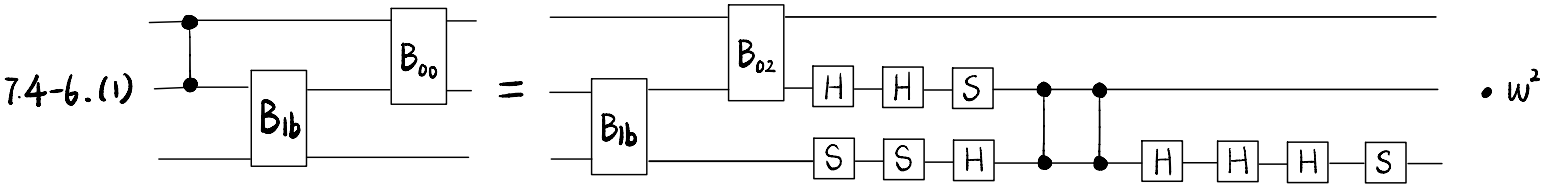
$H^2Z \overset{R_{10}}{=} H^2S'S'S \overset{\text{Def 1}}{=} H^2H^2S^2H^2S \overset{C_2}{=} S^2H^2S$



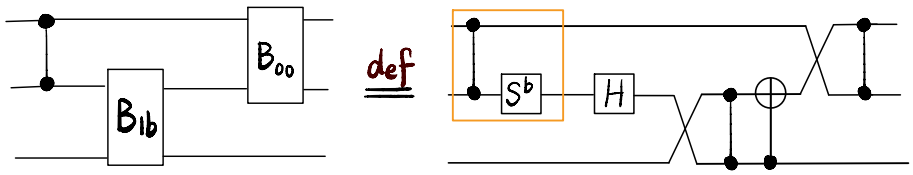
By R_{52}, this completes the proof.



Lem 20 Def 2-5, Def 7, C_2, C_3, C_7, C_8, C_{15}, R_{16}, R_{17}, R_{19}, R_{31} & R_{53} imply

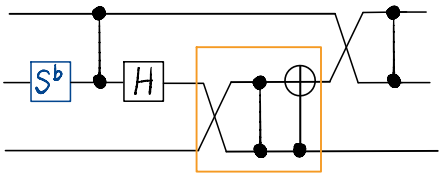


Proof: 7.4-6.(1). LHS :=



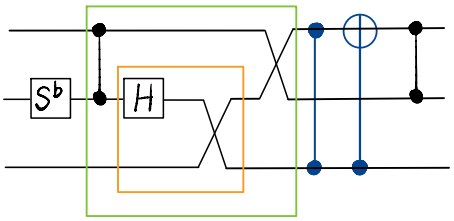
def

C_7



R_{17}, R_{31}

C_{15}^{4}, C_{15}^{14}



R_{19}

C_{15}^{1}