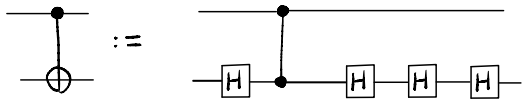
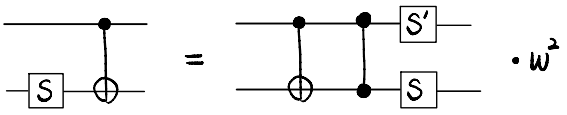
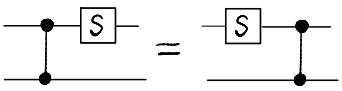
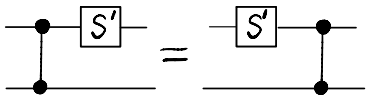
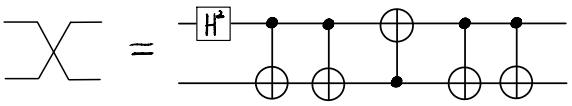
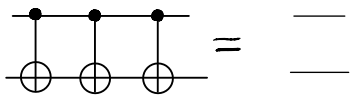
Def 4 : 

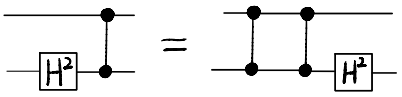
R_{23}^4 : 

$C_1 : w^3 = 1$ $\quad C_2 : H^4 = I$ $\quad C_3 : S^3 = I$ $\quad C_7$: 

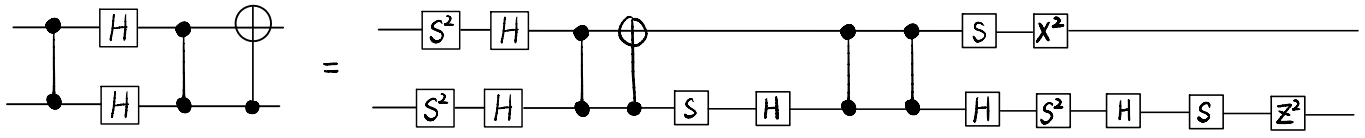
R_{15} : 

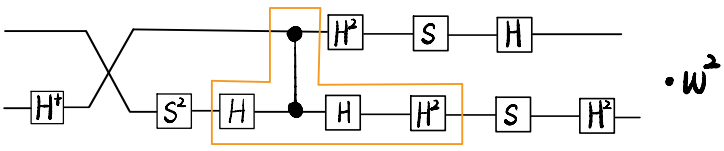
Def 6 : 

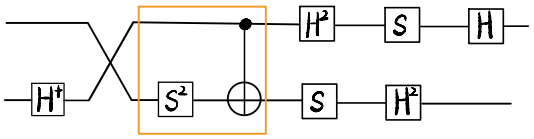
C_6' : 

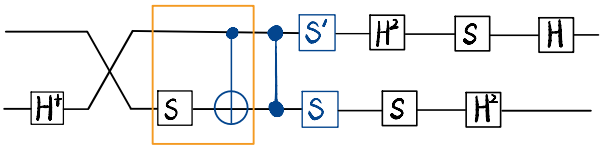
C_8' : 

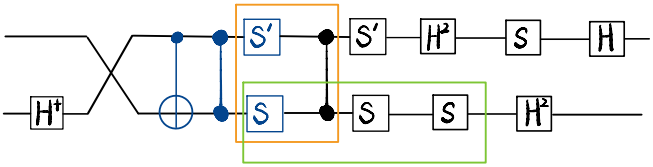
Lem Y

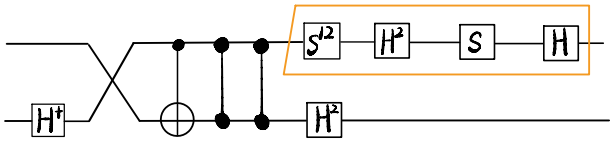
R_{34} : 

Proof cont. 

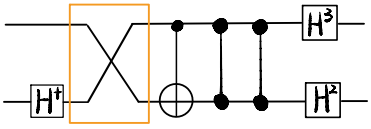
Def 4 

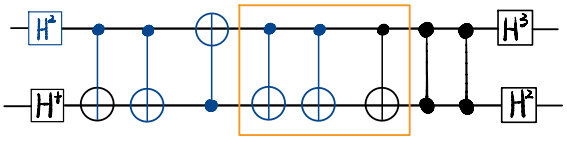
R_{23}^4 

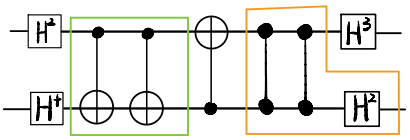
R_{23}^4 

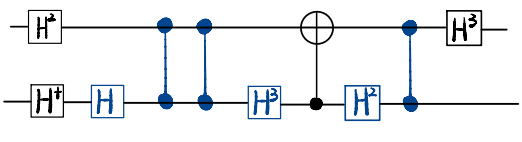
C_1, C_7 / R_{15} 

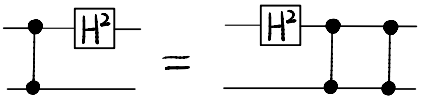
$S'^2 H^2 S H \overset{\text{Def 1}}{=} H^2 S^2 H^2 H^2 S H \overset{C_2}{\underset{C_3}{=}} H^3$

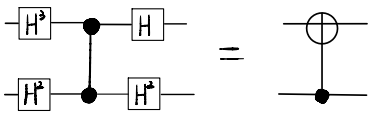
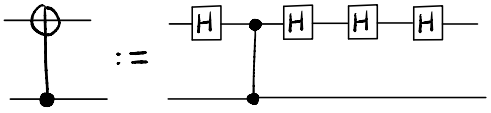
C_2, C_3 / Def 1 

Def 6 

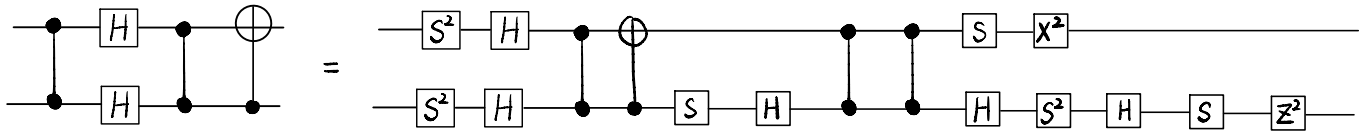
C_6' 

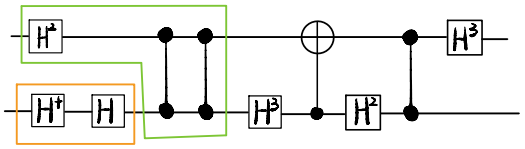
C_2, C_8' / Def 4 

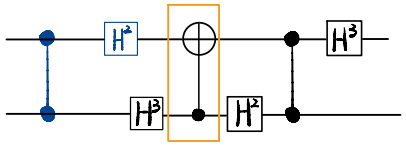
C2 : $H^4 = I$ C8 :  =

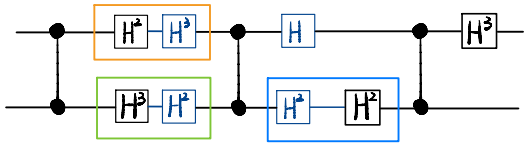
R_{32}^4 :  Def 2 : 

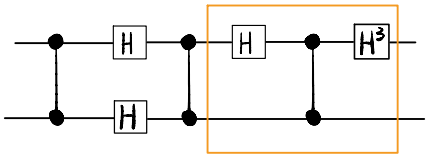
Lem Y

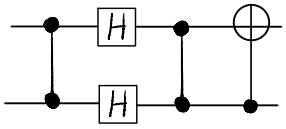
R_{34} :  $\cdot(-w^2)$

Proof cont. 

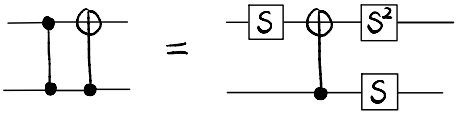
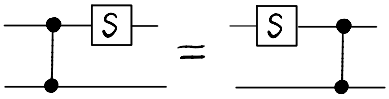
C_2 / C_8 

R_{32}^4 

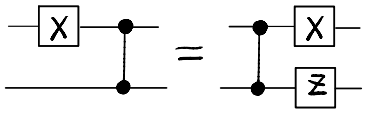
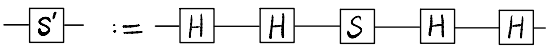
C_2 

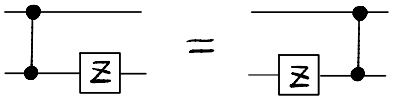
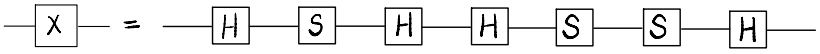
Def 2  =: R_{34}. LHS.

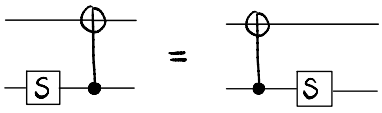
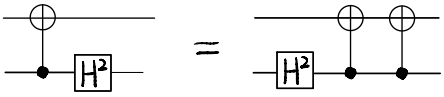
∎

R_{37}:  $\cdot w^2$ C_7: 

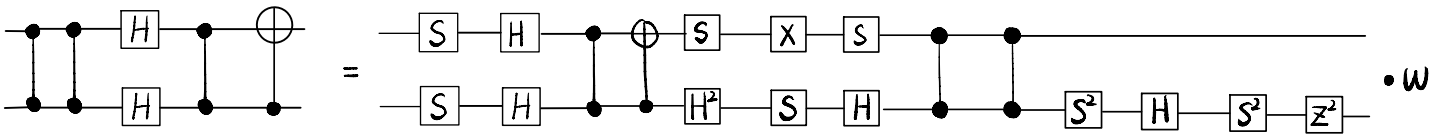
$C_1: w^3 = 1$ $C_2: H^4 = I$ $C_3: S^3 = I$ $C_5: SS' = S'S$ R_{11}:

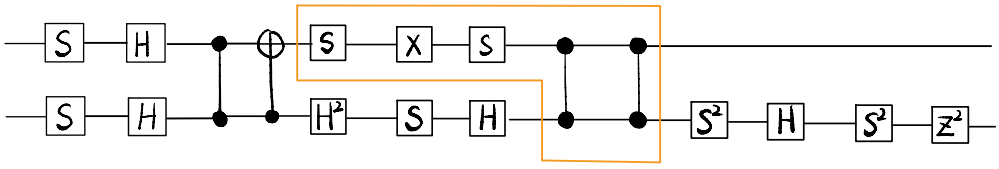
R_{14}:  Def 1 : 

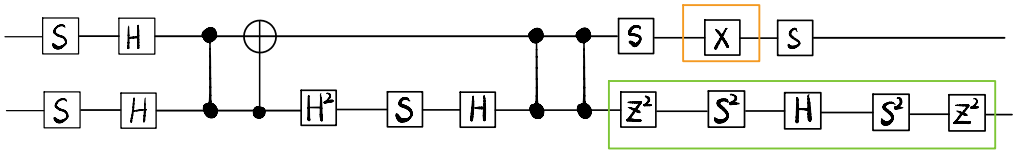
R_{13}:  R_5 : 

R_{24}:  C_8^5: 

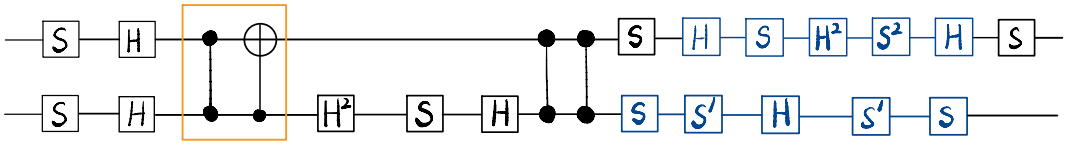
Lem Z Def 1-2, Def 4, C0-8, R_5, R_{11}, R_{13}, R_{14}, R_{15}, R_{23}, R_{24}, R_{25}, R_{32} & R_{37} imply

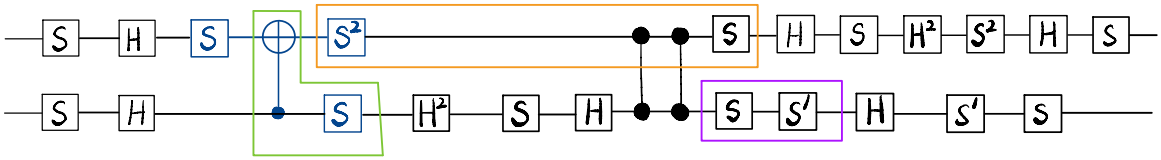
R_{35}:  $\cdot w$

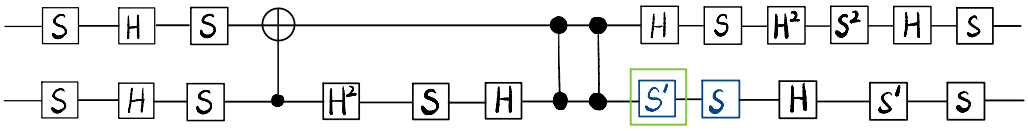
Proof : R_{35}.RHS :=  $\cdot w$

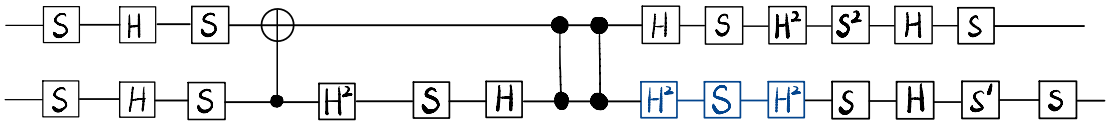
C_7, R_8 / R_{14}  $\cdot w$

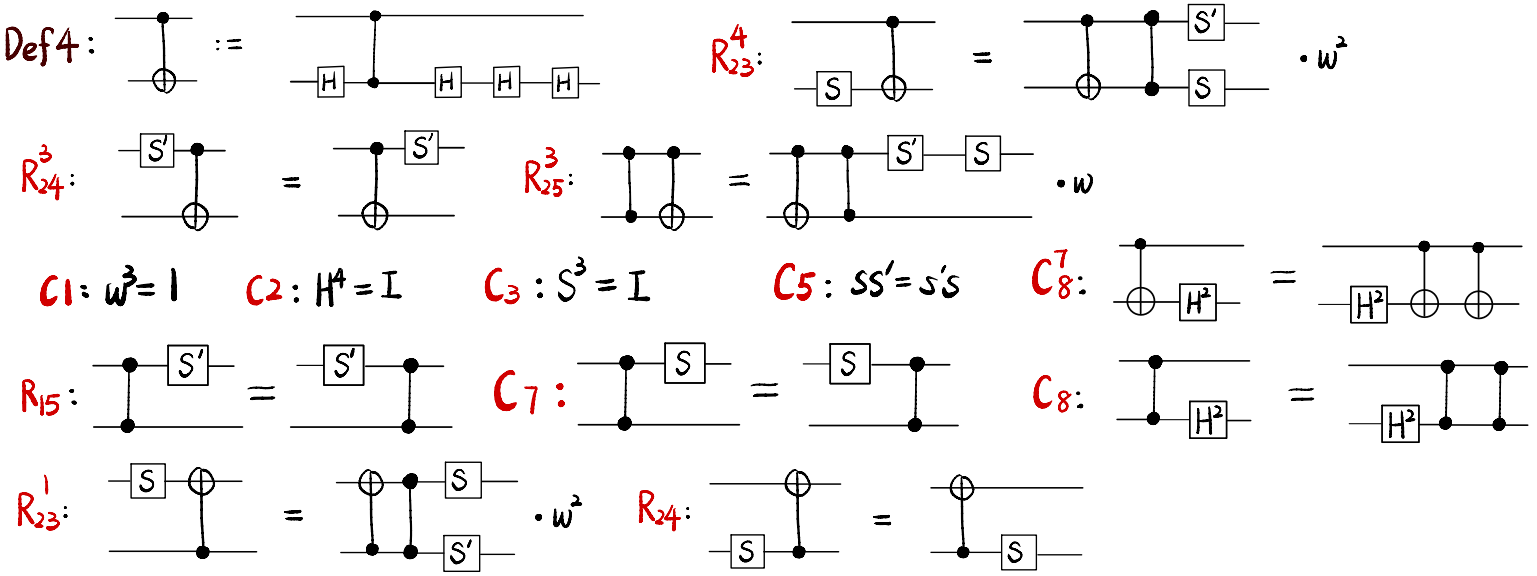
$Z^2S^2HS^2Z^2 \overset{R_{11}}{=} (S'S^2)S^2 \; HS^2(S'S^2) \overset{C_5}{\underset{C_3}{=}} S'SHSS'$

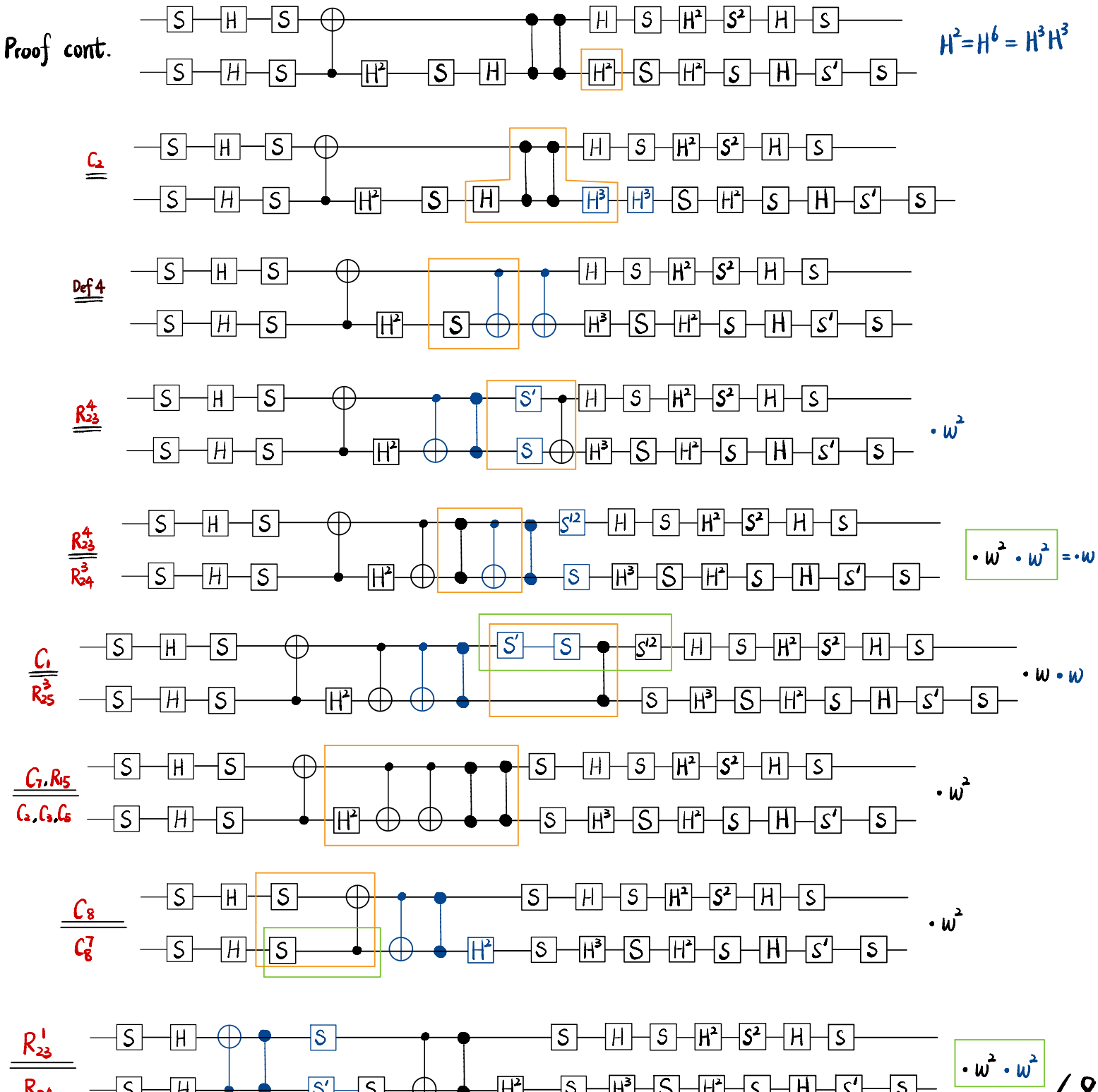
C_3, C_5 / R_5, R_{11}  $\cdot w$

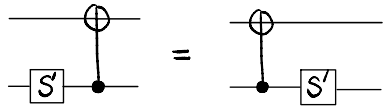
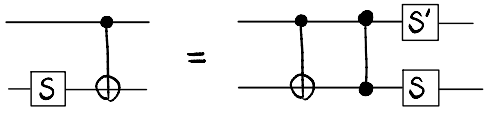
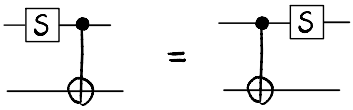
R_{37}  $\cdot w \cdot w^2$

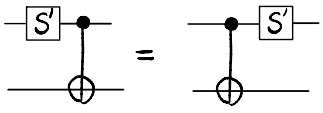
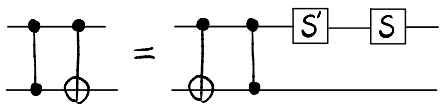
C_1, C_3, C_5 / C_7, R_4 

Def 1 

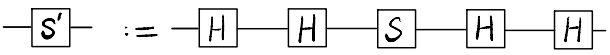

Def 4 :
:=
H
H
H
H
R_{23}^4 :
S
=
S'
S
$\cdot w^2$
R_{24}^3 :
S'
=
S'
R_{25}^3 :
=
S'
S
$\cdot w$
C1 : $w^3 = 1$
C2 : $H^4 = I$
C3 : $S^3 = I$
C5 : $SS' = S'S$
C_8^7 :
H^2
=
H^2
R_{15} :
S'
=
S'
C7 :
S
=
S
C8 :
H^2
=
H^2
R_{23}^1 :
S
=
S
S'
$\cdot w^2$
R_{24} :
S
=
S

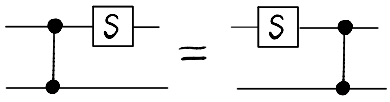
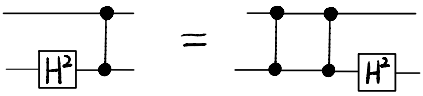
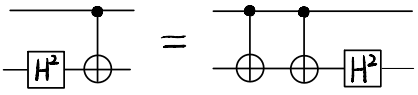

Proof cont.
$H^2 = H^6 = H^3 H^3$
C2
Def 4
R_{23}^4
$\cdot w^2$
R_{23}^4
R_{24}^3
$\cdot w^2 \cdot w^2 = \cdot w$
C1
R_{25}^3
$\cdot w \cdot w$
C7, R15
C2, C3, C5
$\cdot w^2$
C8
C_8^7
$\cdot w^2$
R_{23}^1
R_{24}
$\cdot w^2 \cdot w^2$

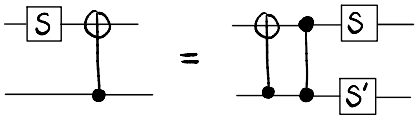
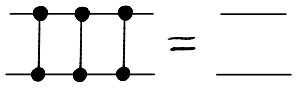
R^1_{24}:  R^4_{23}:  R^2_{24}: 

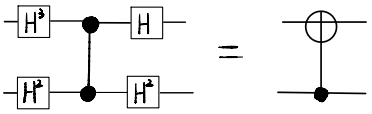
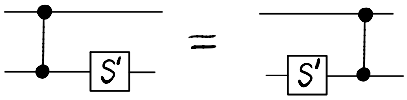
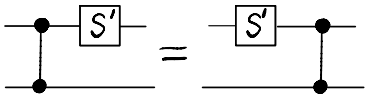
R^3_{24}:  R^3_{25}: 

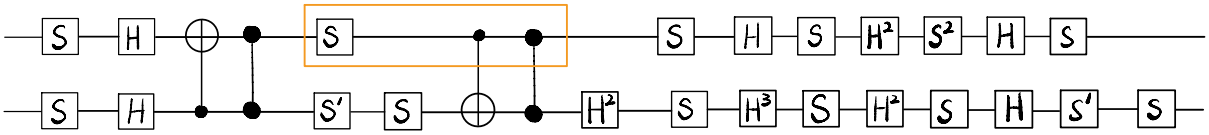
C1: $w^3 = 1$ C2: $H^4 = I$ C3: $S^3 = I$ C5: $SS' = S'S$

Def 1: 

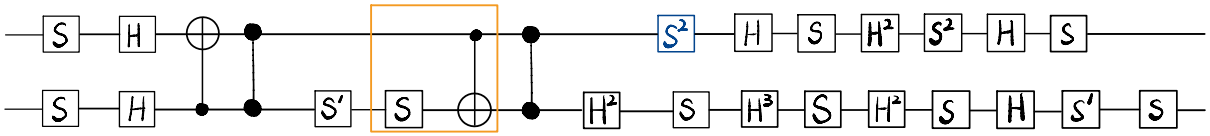
C_7:  C^1_8:  C^8_8: 

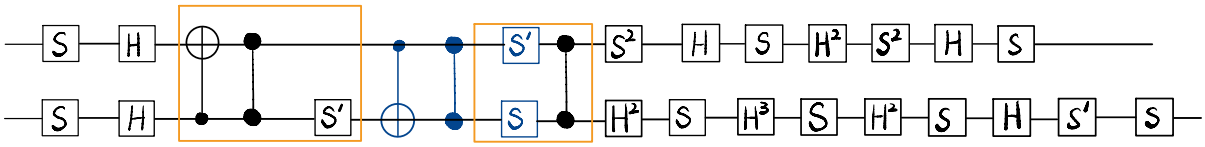
R^1_{23}:  C_6: 

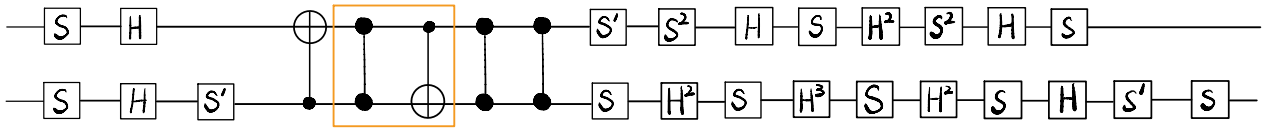
R^4_{32}:  R_{15}:  

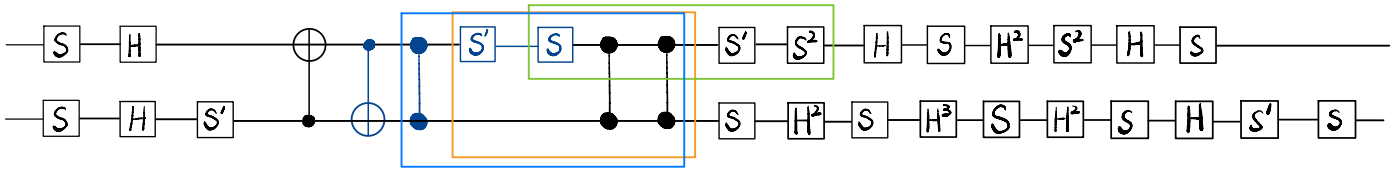
Proof cont. 

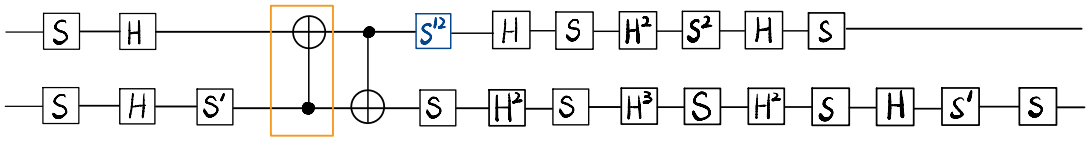
$\cdot w^2 \cdot w^2$

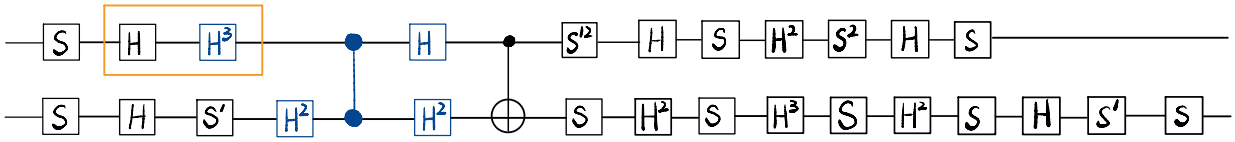
$\underline{C_1, C_7}$ $\underline{R^2_{24}}$  $\cdot w$

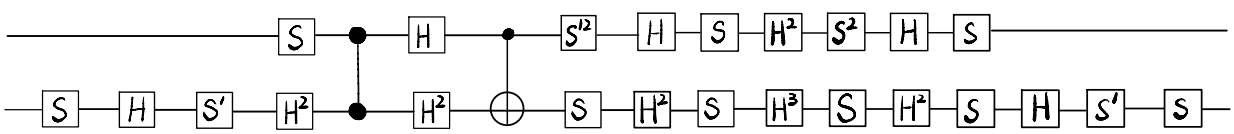
$\underline{R^4_{23}}$ $\underline{\text{Def 1}}$  $\cdot w \cdot w^2$

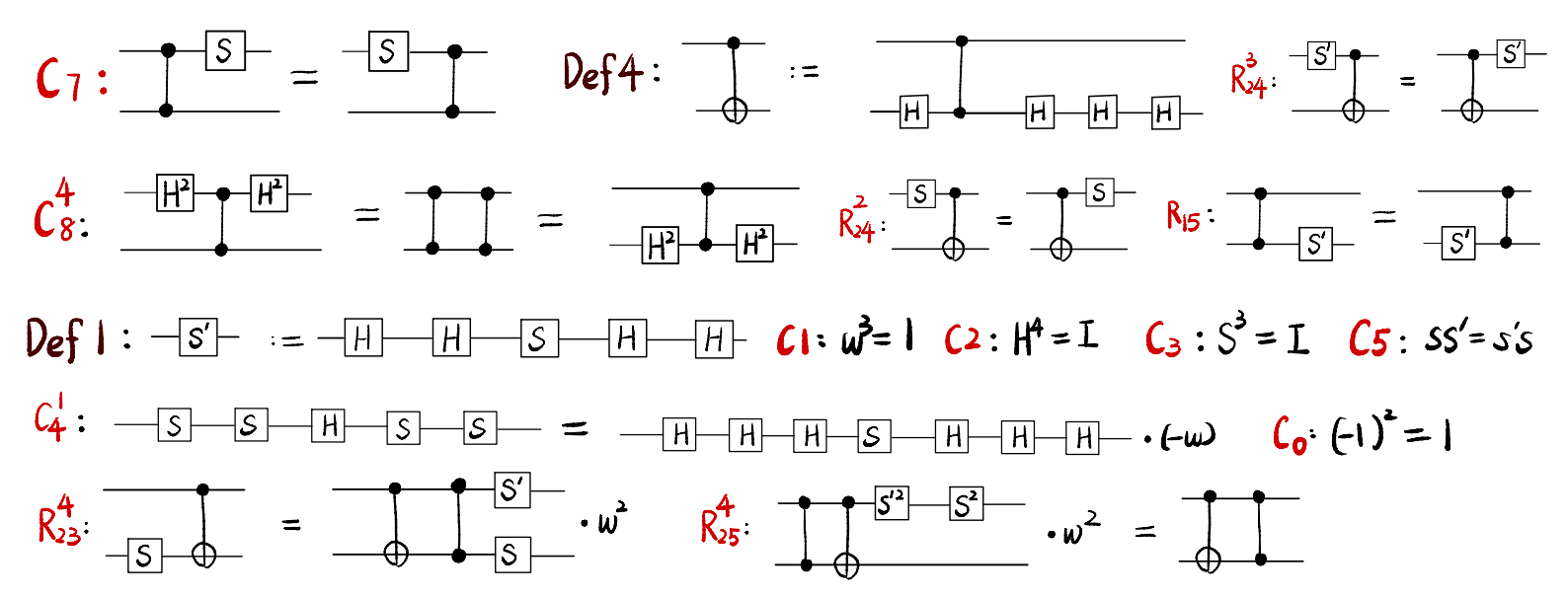
$\underline{C_1, R^1_{24}}$ $\underline{C_7, R_{15}}$ 

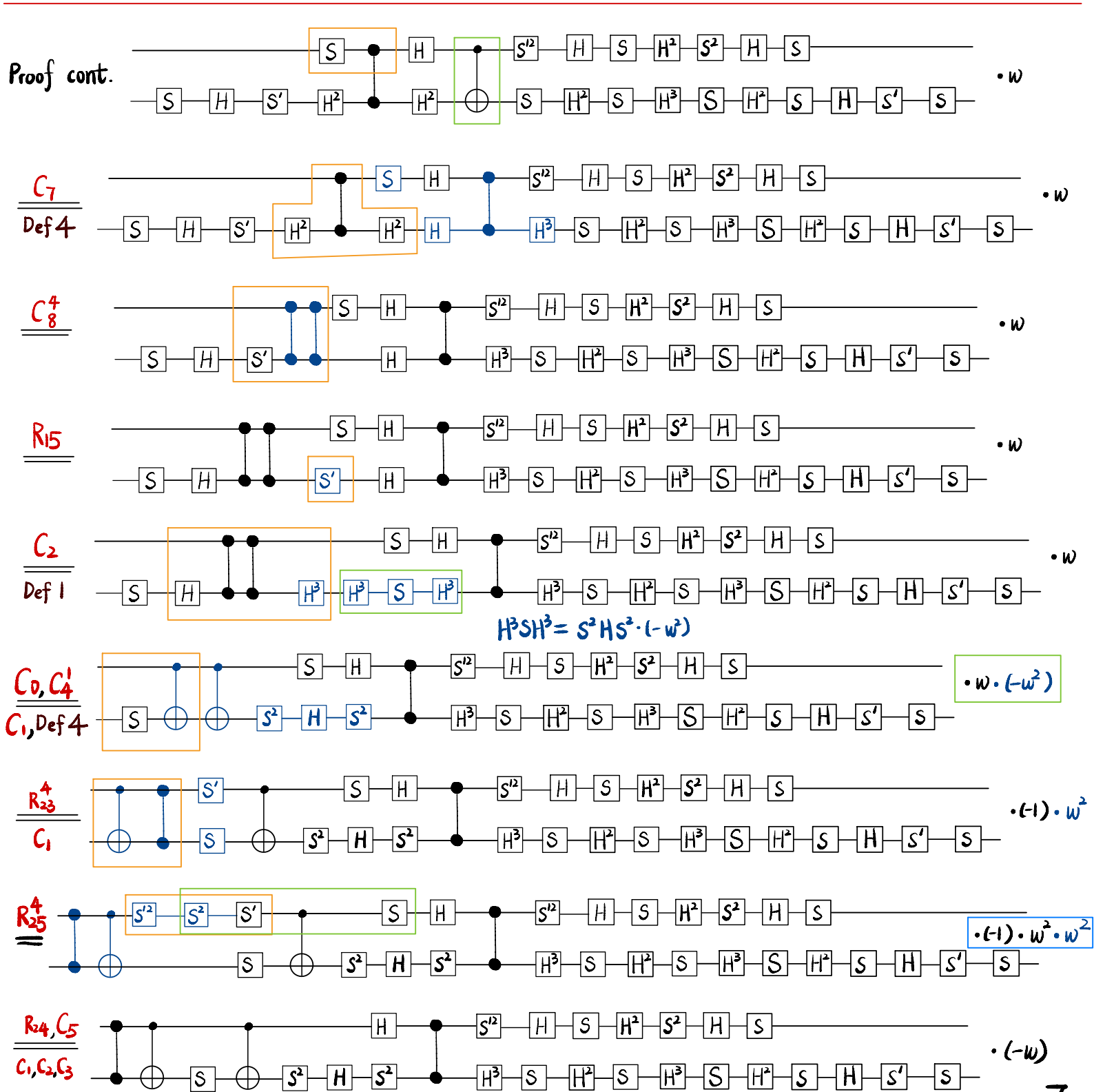
$\underline{R^3_{25}}$  $\cdot w$

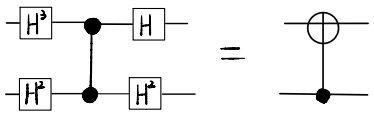
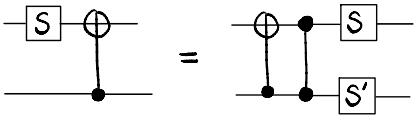
$\underline{C_3, C_5, C_6}$ $\underline{C_7, R_{15}}$  $\cdot w$

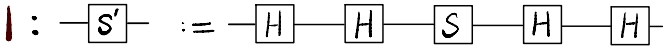
$\underline{R^4_{32}}$  $\cdot w$

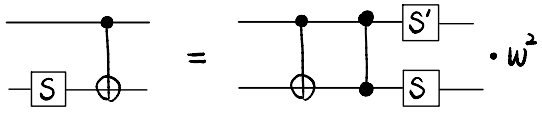
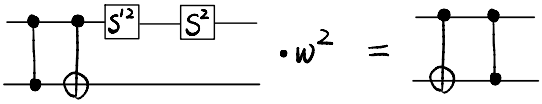
$\underline{C_2}$  $\cdot w$

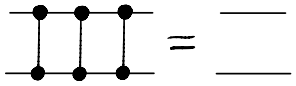
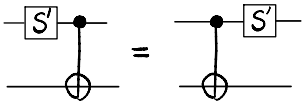
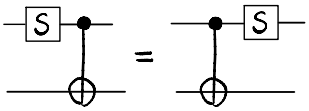

C7 :
Def 4 :
:=
R24 3 :
C8 4 :
R24 2 :
R15 :
Def 1 :
C1 : w3 = 1
C2 : H4 = I
C3 : S3 = I
C5 : SS' = S'S
C4 1 :
C0 : (-1)2 = 1
R23 4 :
R25 4 :
• w2

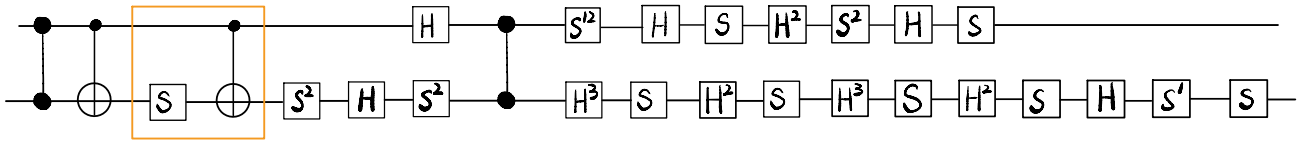

Proof cont.
• w
C7
Def 4
C8 4
R15
C2
Def 1
H3SH3 = S2HS2 · (-w2)
C0, C4 1
C1, Def 4
• w · (-w2)
R23 4
C1
• (-1) · w2
R25 4
• (-1) · w2 · w2
R24, C5
C1, C2, C3
• (-w)

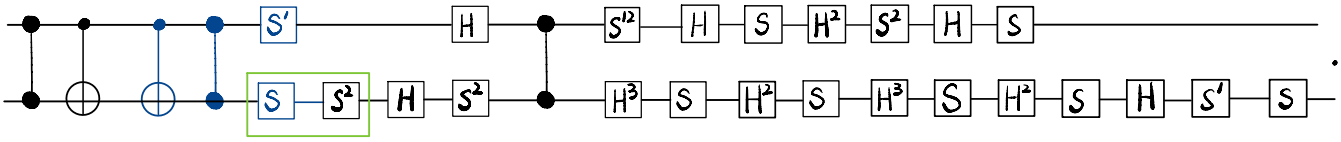
R_{32}^4:  R_{23}^1:  C_0: $(-1)^2 = 1$

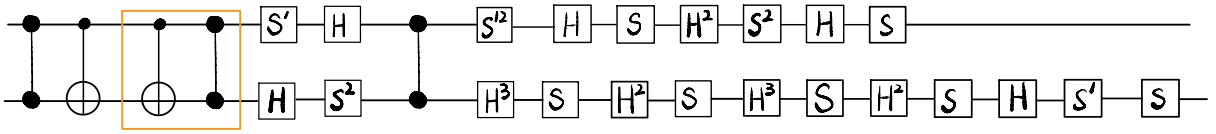
Def 1:  C_1: $w^3 = 1$ C_2: $H^4 = I$ C_3: $S^3 = I$ C_5: $SS' = S'S$

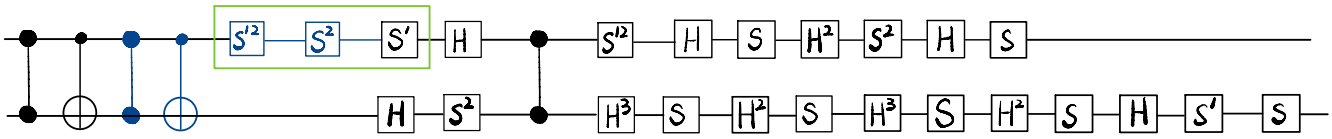
R_{23}^4:  R_{25}^4: 

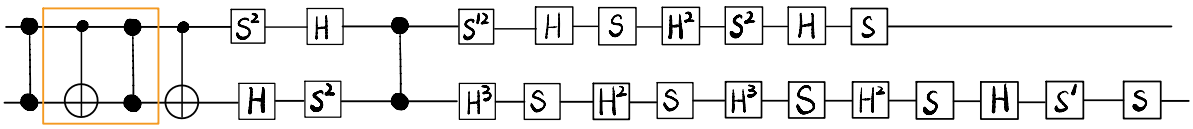
C_6:  R_{24}^3:  R_{24}^2: 

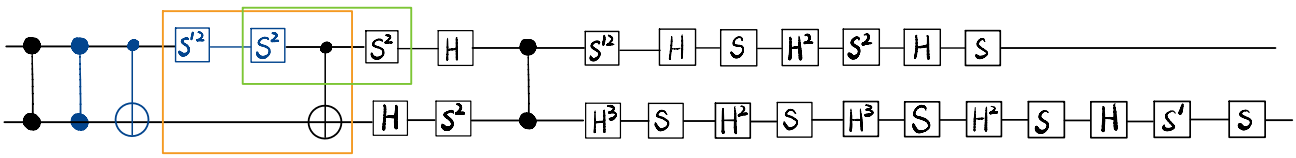
Proof cont. 

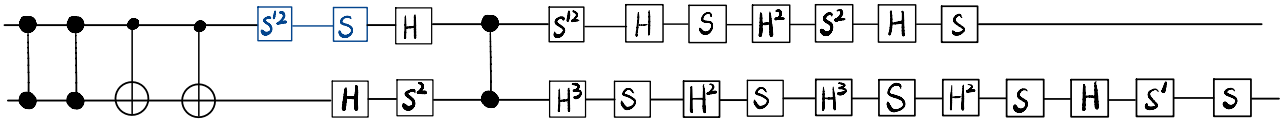
R_{23}^4 

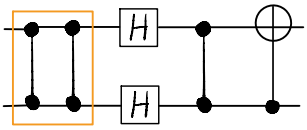
C_1 / C_3 

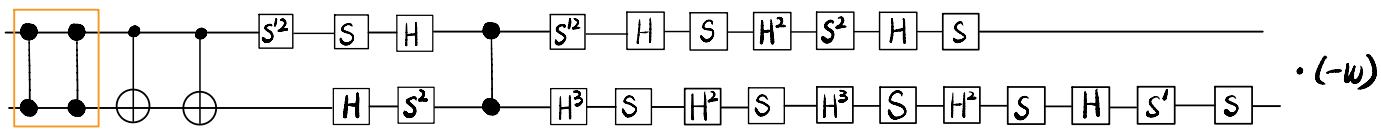
R_{25}^4 

C_2, C_3 / C_5 

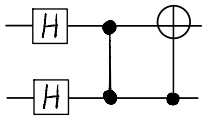
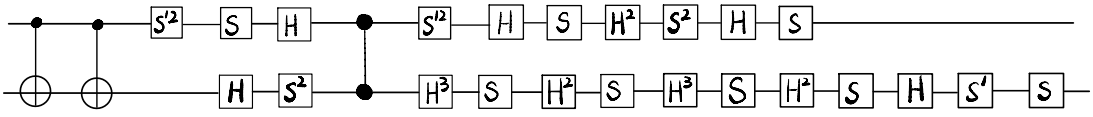
R_{25}^4 

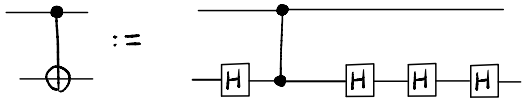
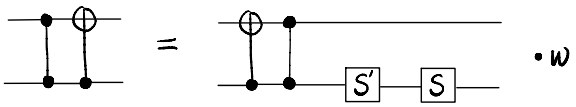
R_{24} / C_1, C_3 

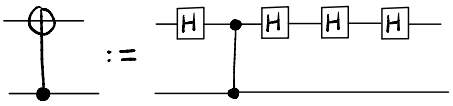
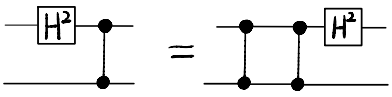
R_{35}:  WTS



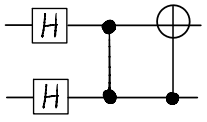
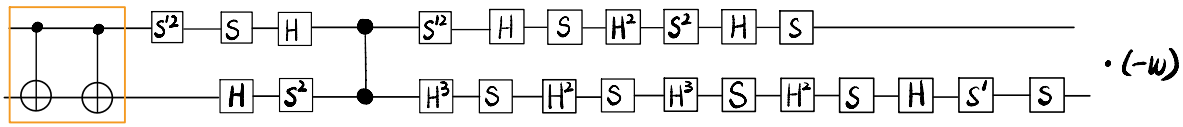
$\| C_6$

R_{35}:  WTS 

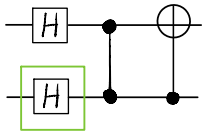
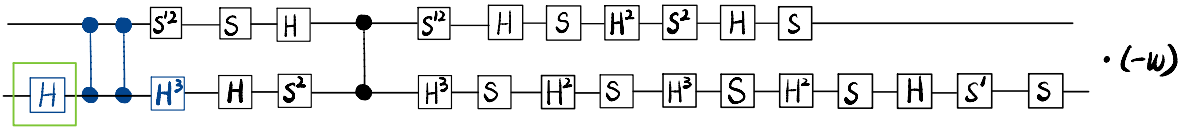
Def 4 :  C2 : $H^4 = I$ $R_{25}^{\dagger}$: 

Def 2 :  $C_8^{\dagger}$: 

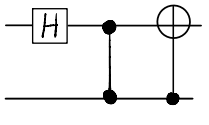
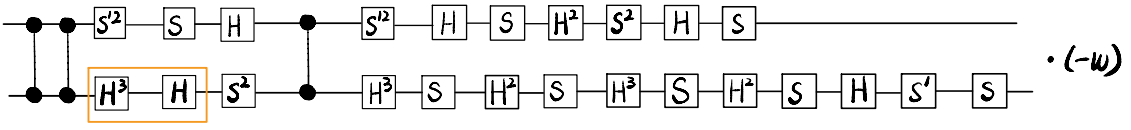
Proof cont.

R_{35} :  WTS 

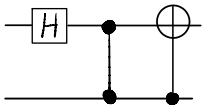
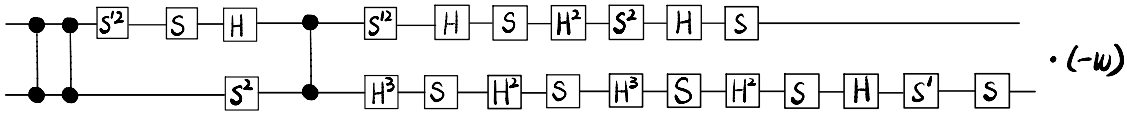
Def 4 ||| C_2

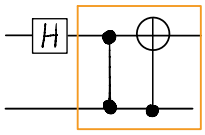
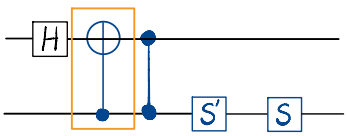
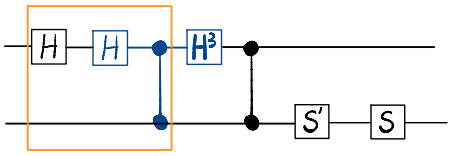
R_{35} :  WTS 

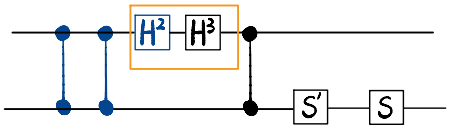
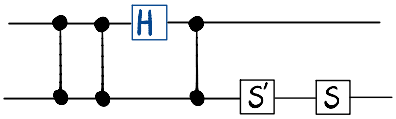
||| C_2

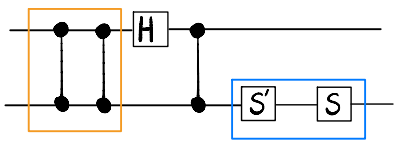
R_{35} :  WTS 

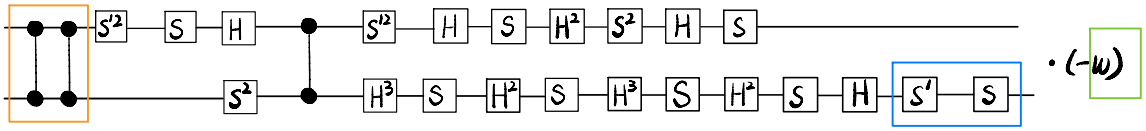
||| C_2

R_{35} :  WTS 

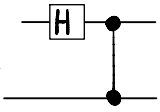
R_{35}. LHS :=  $R_{25}^{\dagger}$  Def4 

$C_8^{\dagger}$  C_2 

Hence, R_{35} :  WTS



C_1, C_2 ||| C_3, C_6

R_{35} :  WTS