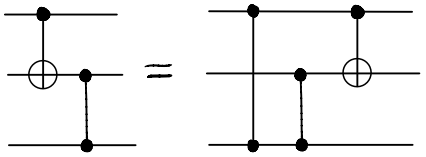
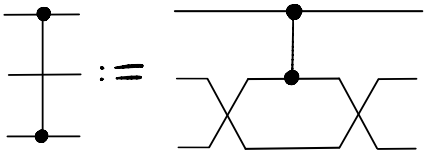
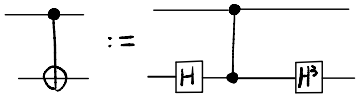
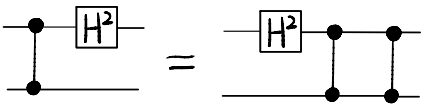
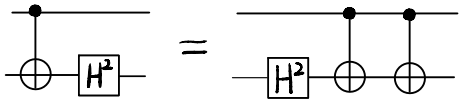
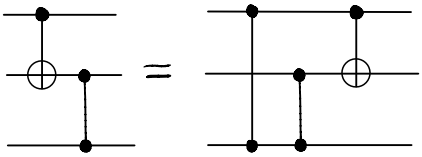
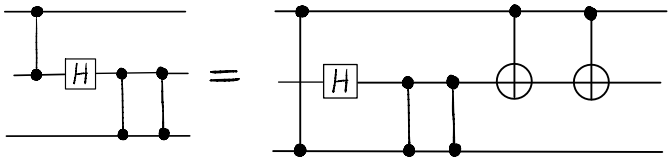
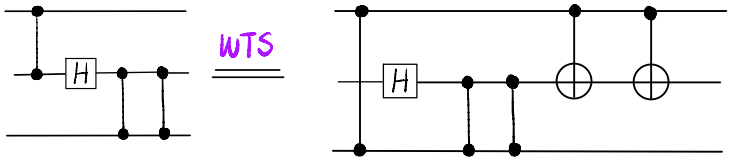
C_{16}:  Def 5:  C_2: $H^2 = I$

Def 4:  C_8: 

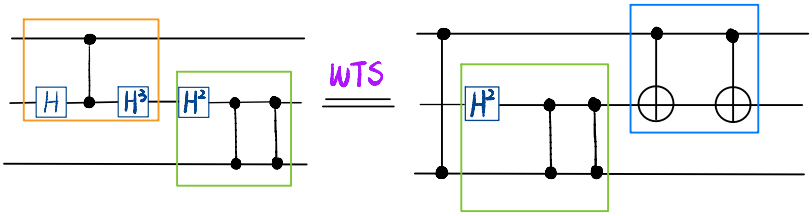
C_8^7:  C_{16}: 

Lem G Def 4-5, C_2, C_8 & C_{16} imply

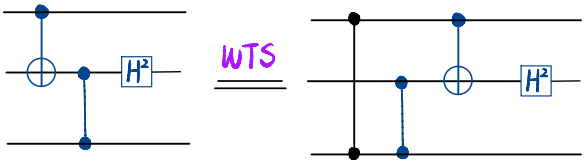
R_{39}: 

Proof: R_{39}: 

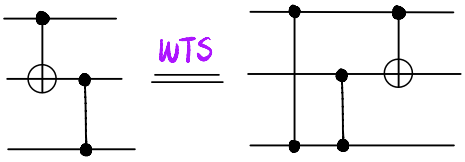
C_2 |||

R_{39}: 

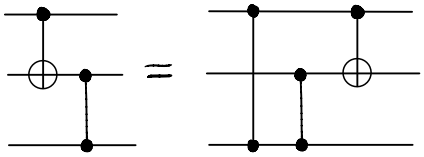
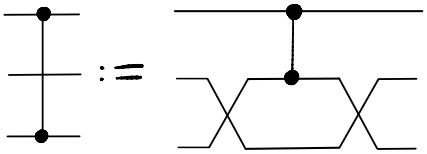
Def 4 ||| C_8, C_8^7

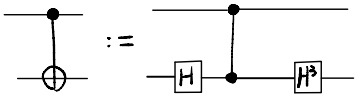
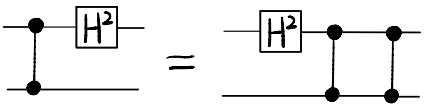
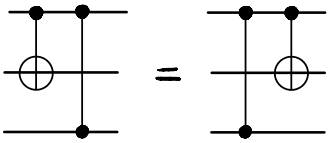
R_{39}: 

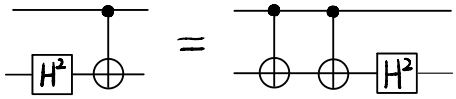
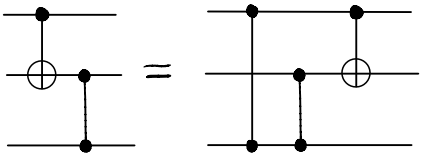
C_2 |||

R_{39}: 

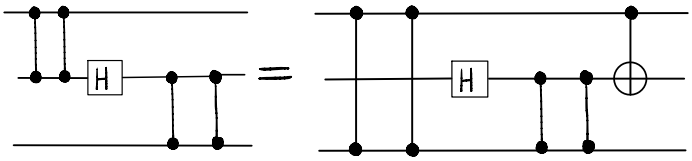
By C_{16}, this completes the proof.

C_{16}:  Def 5:  C_2: $H^2 = I$

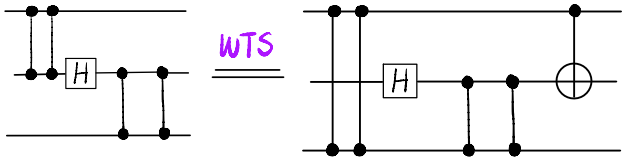
Def 4:  C_8:  C_{13}^5: 

C_8^8:  C_{16}: 

Lem H Def 4-5, C_2, C_8, C_{13} & C_{16} imply

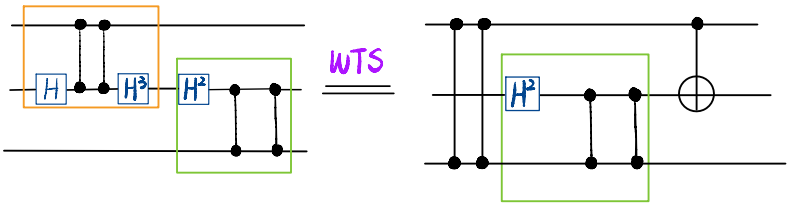
R_{40}: 

Proof:

R_{40}: 

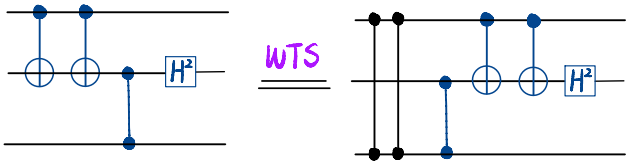
WTS

C_2 |||

R_{40}: 

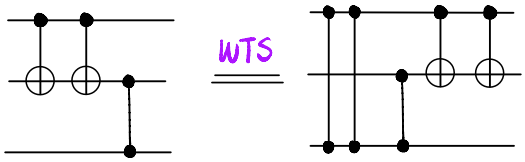
WTS

Def 4 ||| C_8, C_8^8

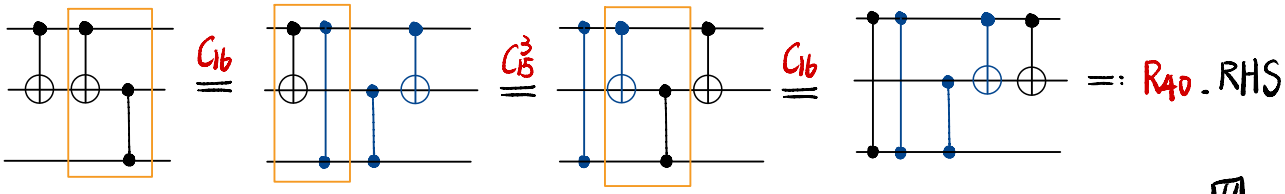
R_{40}: 

WTS

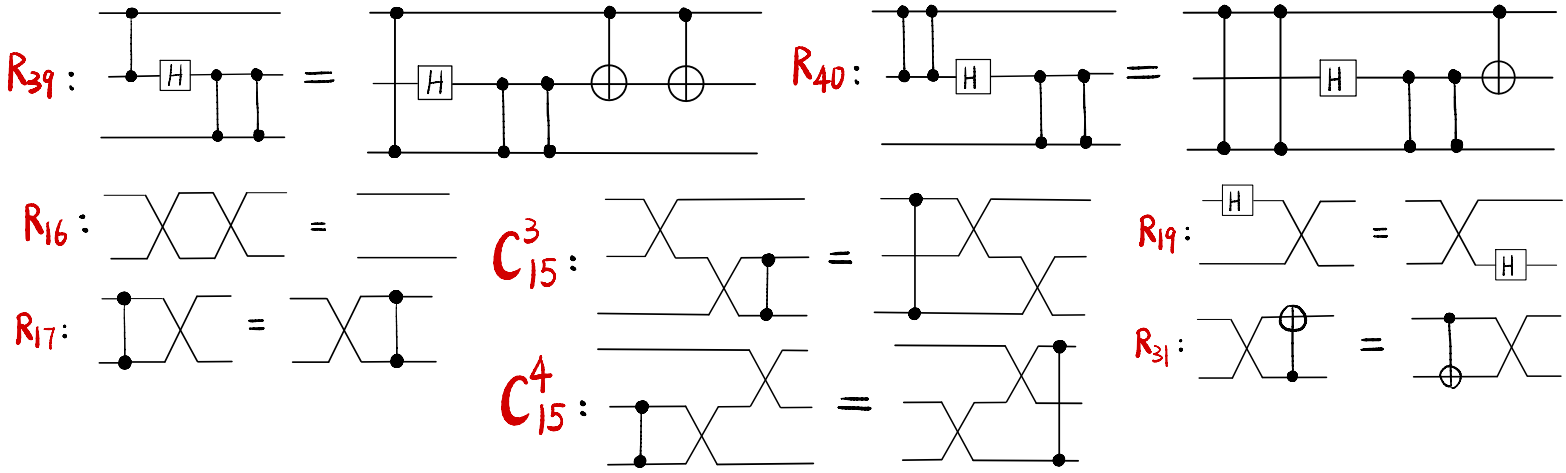
C_2 |||

R_{40}: 

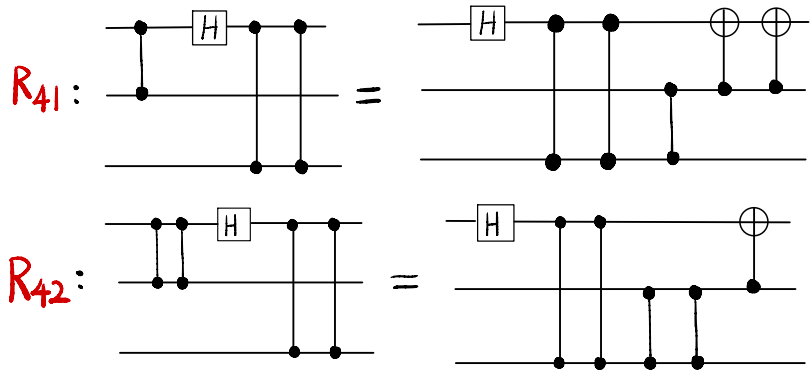
WTS

$R_{40}.LHS :=$ 

C_{16} = C_{15}^3 = C_{16} $=: R_{40}.RHS$

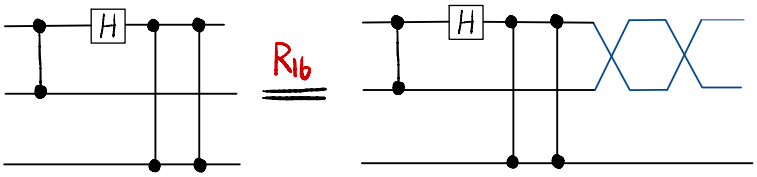


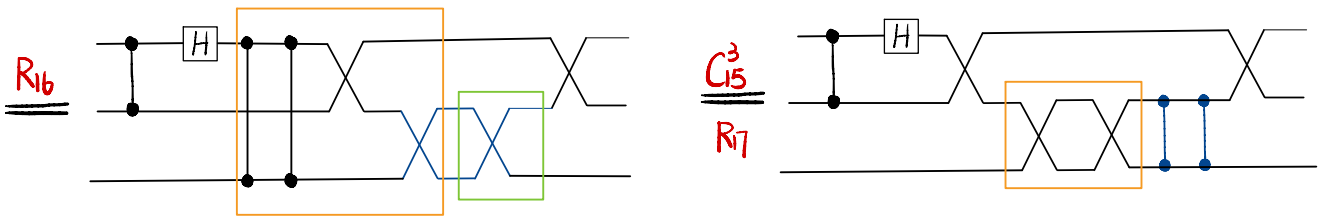
Lem I Def 2, Def 4-5, R_{16}, R_{17}, R_{19}, R_{31}, R_{39}, R_{40}, C_{13} & C_{15} imply

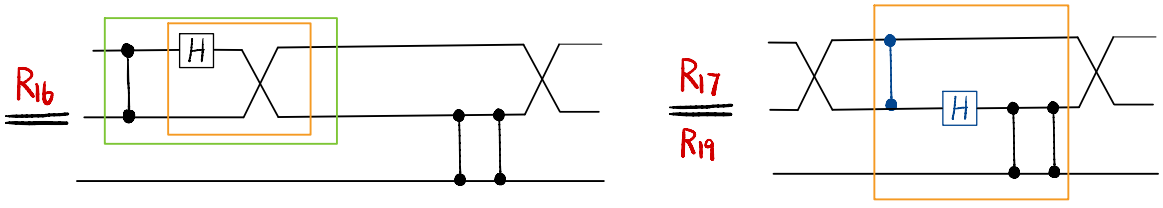


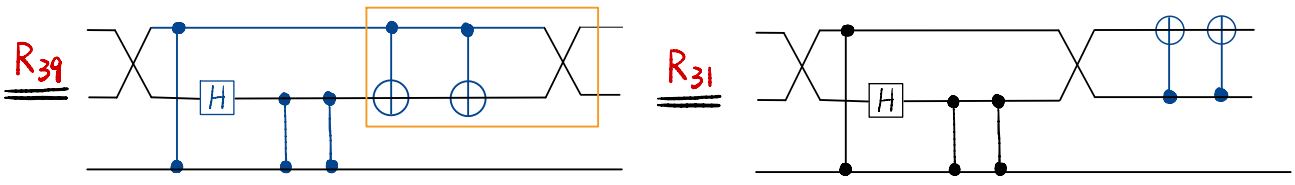
Proof:

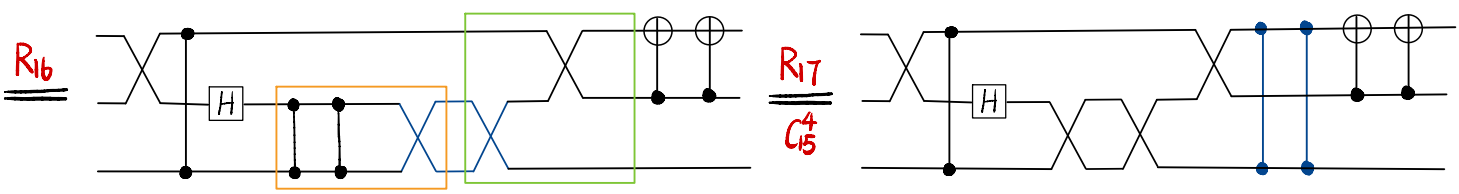
$R_{41}.LHS :=$

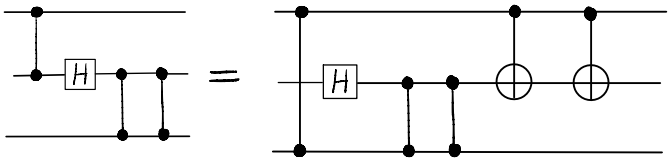


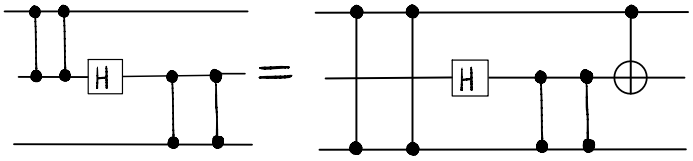


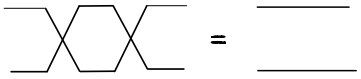


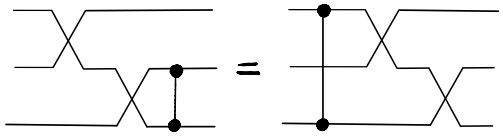


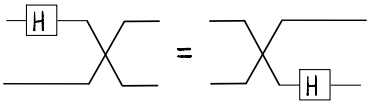


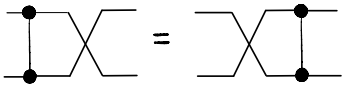
R_{39} : 

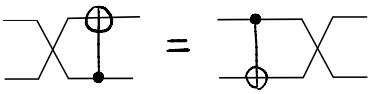
R_{40} : 

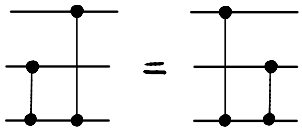
R_{16} : 

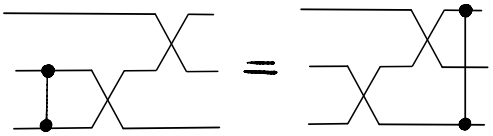
C^3_{15} : 

R_{19} : 

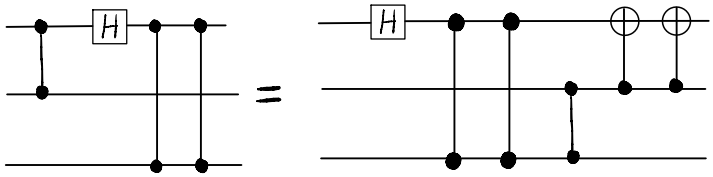
R_{17} : 

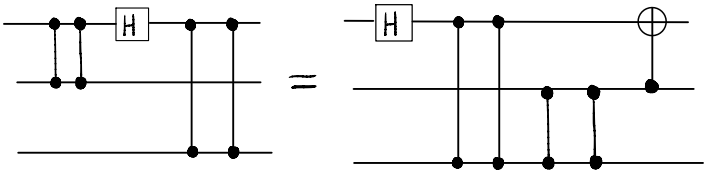
R_{31} : 

C^2_{13} : 

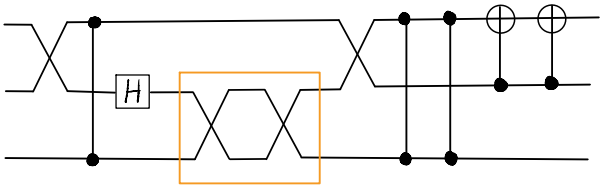
C^4_{15} : 

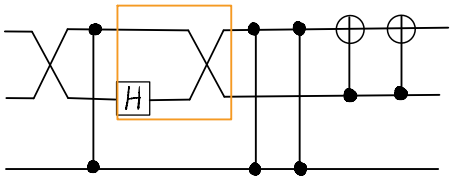
Lem I

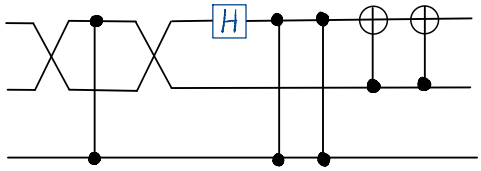
R_{41} : 

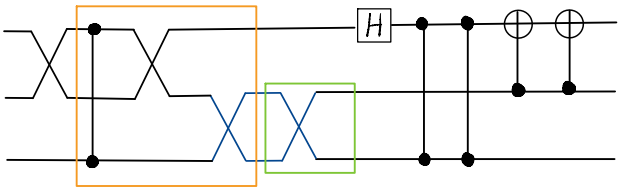
R_{42} : 

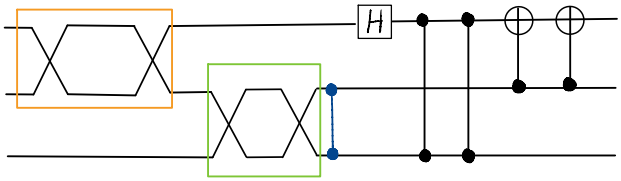
Proof cont.

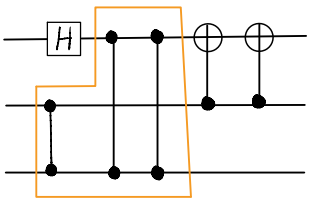
$R_{41}.LHS$ = 

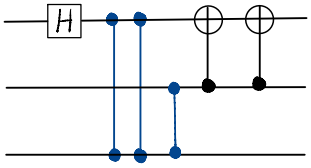
R_{16} 

R_{19} 

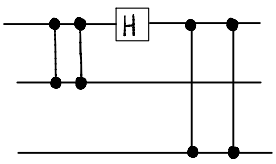
R_{16} 

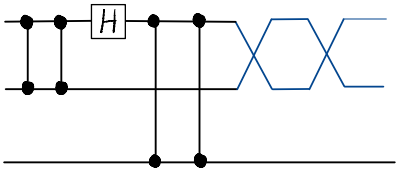
C^3_{15} / R_7 

R_{16} 

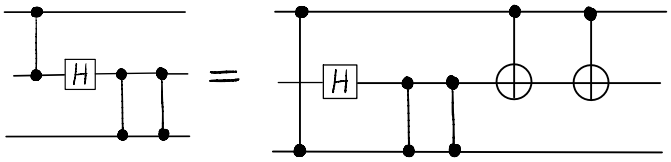
C^2_{13} 

$=: R_{41}.RHS$

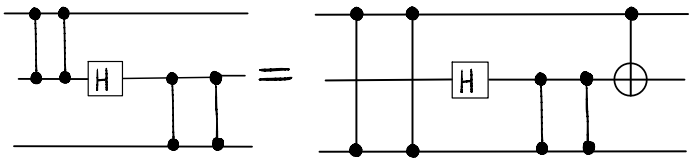
$R_{42}.LHS :=$ 

R_{16} 

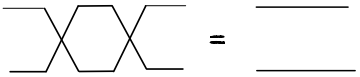
R_{39} :



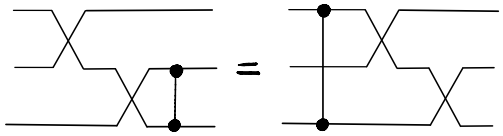
R_{40} :



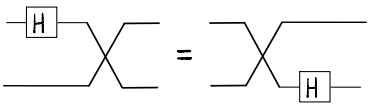
R_{16} :



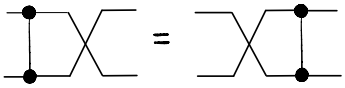
C^3_{15} :



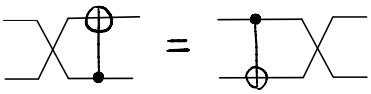
R_{19} :



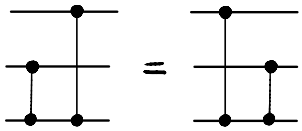
R_{17} :



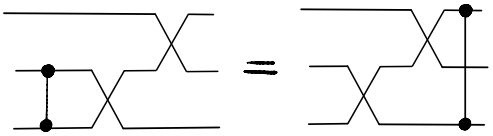
R_{31} :



C^2_{13} :

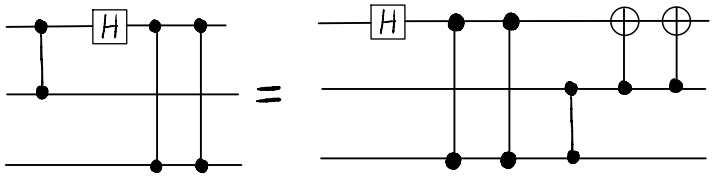


C^4_{15} :

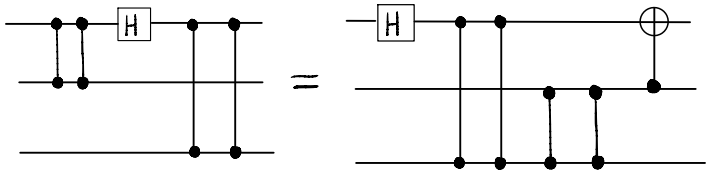


Lem I

R_{41} :

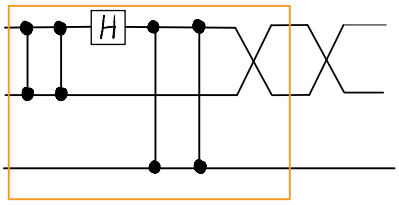


R_{42} :

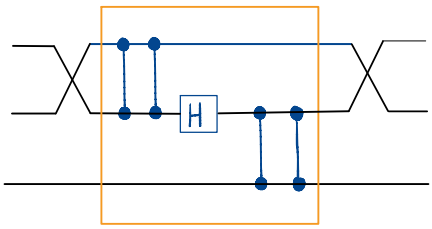


Proof cont.

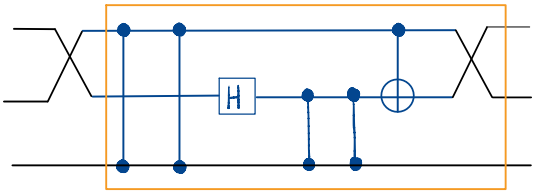
R_{42}. LHS =



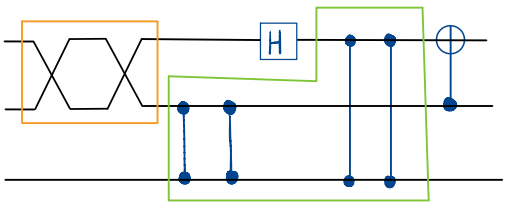
$\overset{\cdots}{=}$



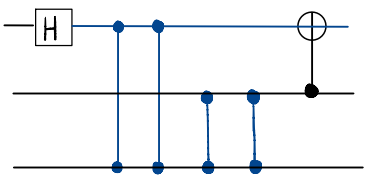
$\overset{R_{40}}{=}$



$\overset{\cdots}{=}$

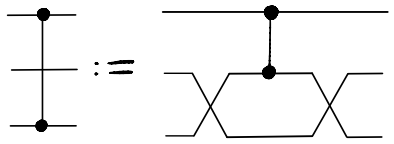


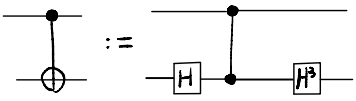
$\overset{C^2_{13}}{\underset{R_{16}}{=}}$

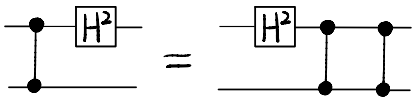


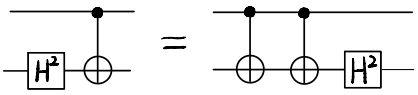
=: R_{42}. RHS

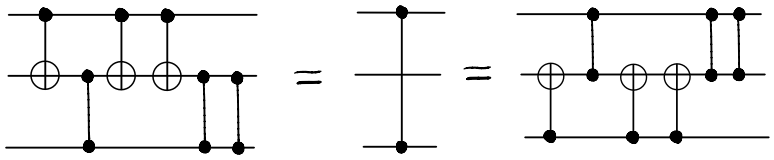
∎

Def 5 : 

Def 4 : 

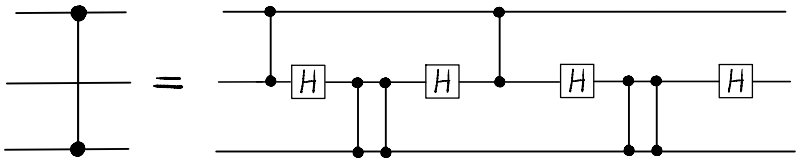
C_8 : 

C_8^8 : 

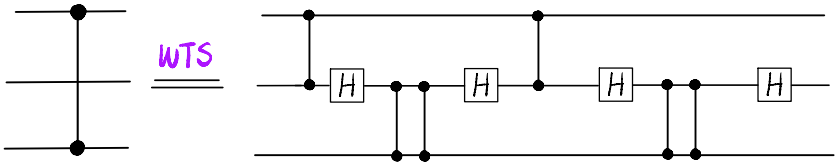
C_{16}^4 : 

$C_2 : H^4 = I$

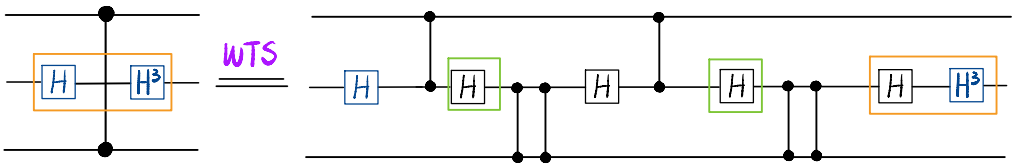
Lem K Def 4-5, C_2, C_8 & C_{16} imply

R_{45}: 

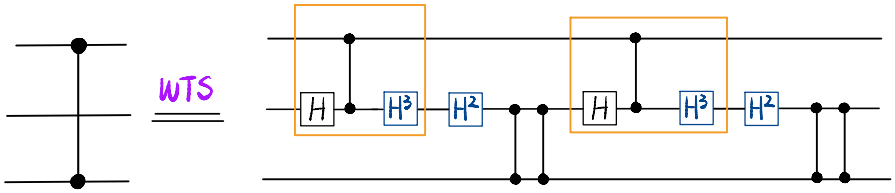
Proof:

R_{45}: 

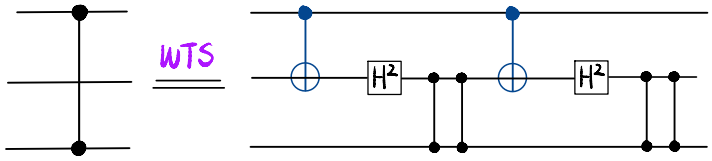
C_2 |||

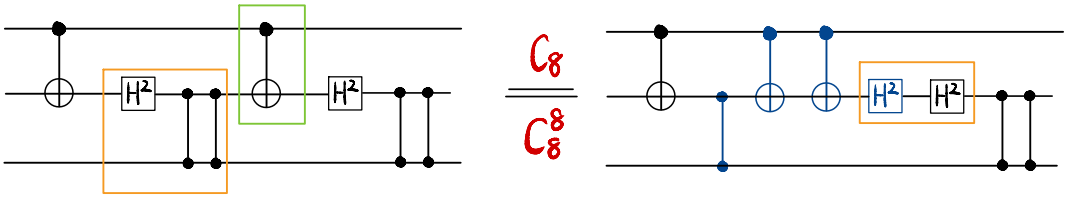
R_{45}: 

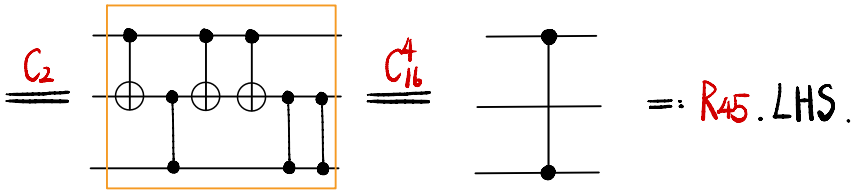
C_2 |||

R_{45}: 

||| Def 4

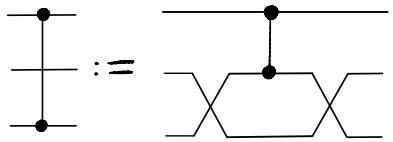
R_{45}: 

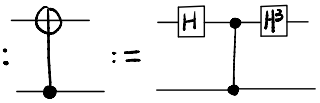
Then $R_{45}.RHS :=$ 

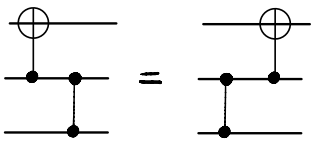
C_2 

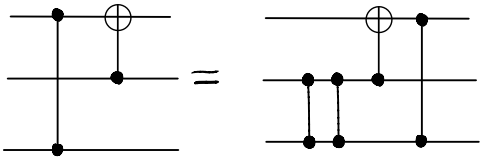
$=: R_{45}.LHS.$

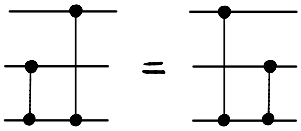
///

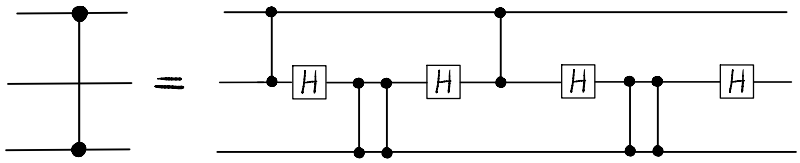
Def 5: 

Def 2: 

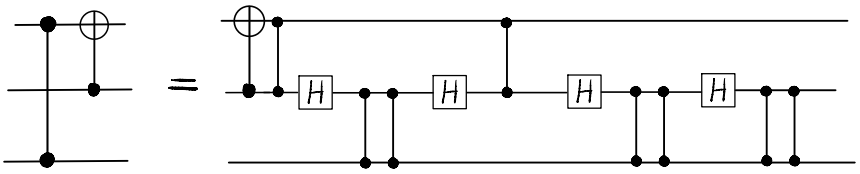
C_{13}^{3}: 

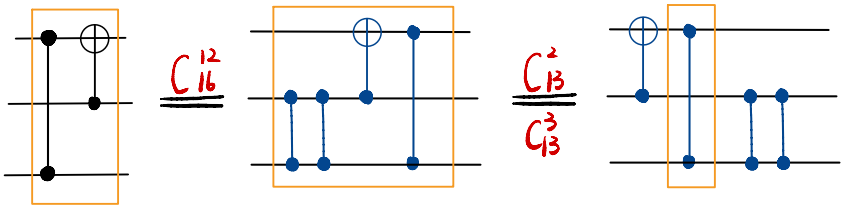
C_{16}^{12}: 

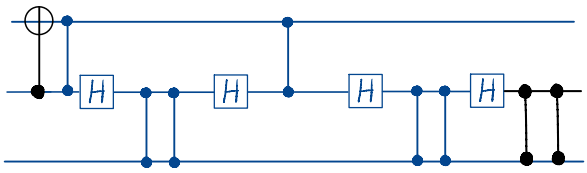
C_{13}^{2}: 

R_{45}: 

Lem L Def 2, Def 5, C_{13}, C_{16} & R_{45} imply

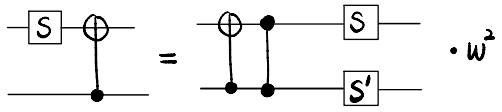
R_{46}: 

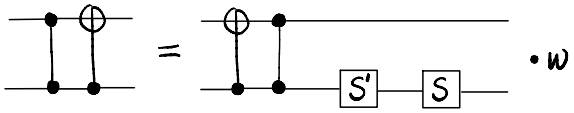
Proof: R_{46}.LHS := 

R_{45} 

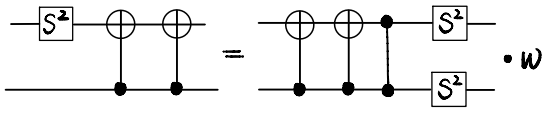
=: R_{46}.RHS.

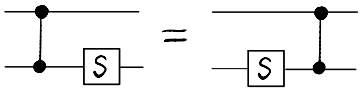
∎

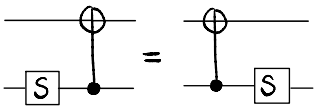
R_{23}^*:  $\cdot w^2$

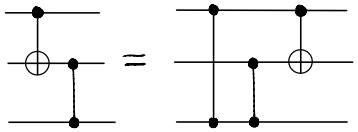
R_{25}^*:  $\cdot w$

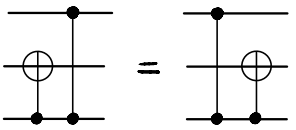
$C_3 : S^3 = I$

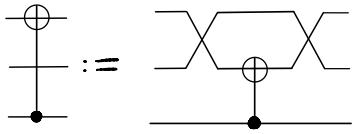
$R_{23\text{-}25}^*$:  $\cdot w$

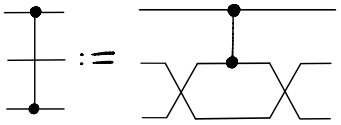
C_7: 

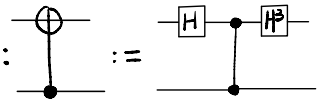
R_{24}: 

C_{16}: 

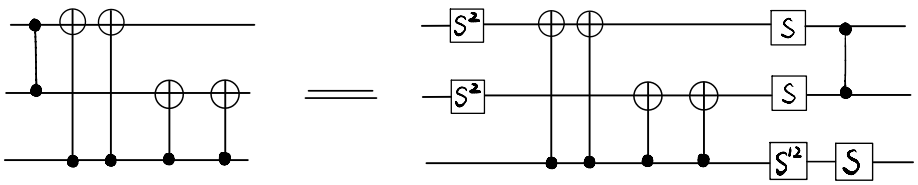
C_{13}^7: 

Def 7 : 

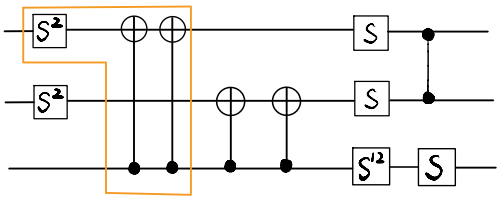
Def 5 : 

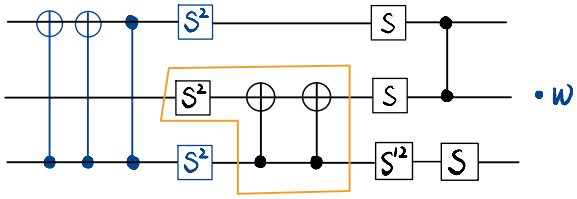
Def 2 : 

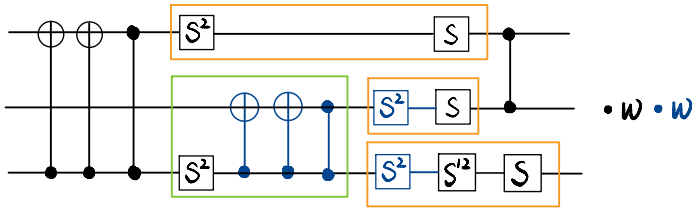
Lem M Def 2, Def 5, Def 7, $C_3, C_6, C_7, C_{13}, C_{16}, R_{15}, R_{23}^*, R_{25}^*, R_{23\text{-}25}^*$ & R_{24} imply

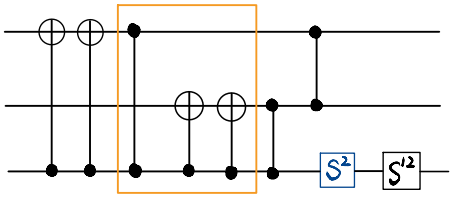
R_{43}: 

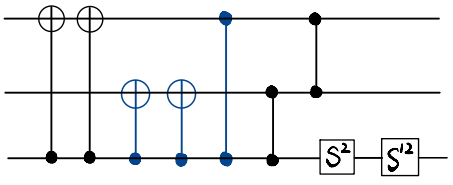
Proof:

$R_{43}.RHS :=$ 

$R_{23\text{-}25}^*$  $\cdot w$

$R_{23\text{-}25}^*$  $\cdot w \cdot w$

C_3, C_7 / R_{24}  $\cdot w^2$

C_{13}^7  $\cdot w^2$