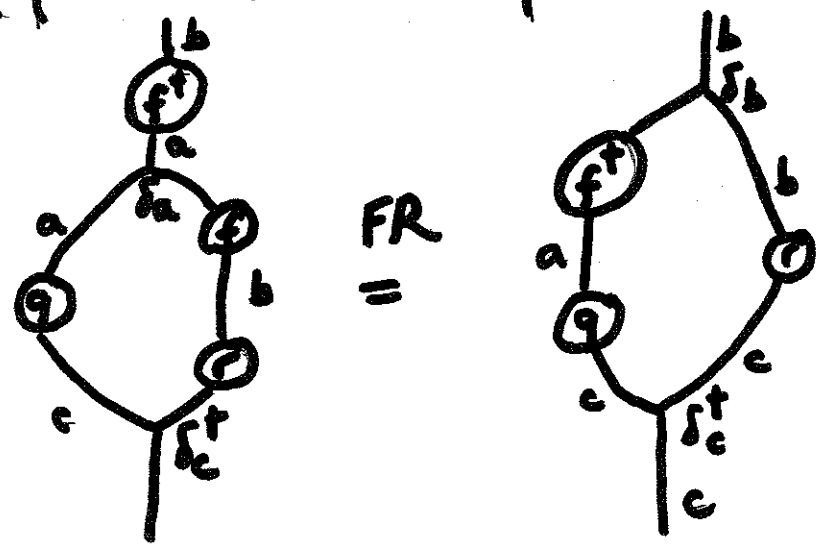


FR : given map $f: a \rightarrow b$, $f \dashv f^\dagger: b \dashv a$
 $q: a \dashv c$, $r: b \dashv c$

canonical $(q \wedge r f) f^\dagger \rightarrow q f^\dagger \wedge r$ is an iso.



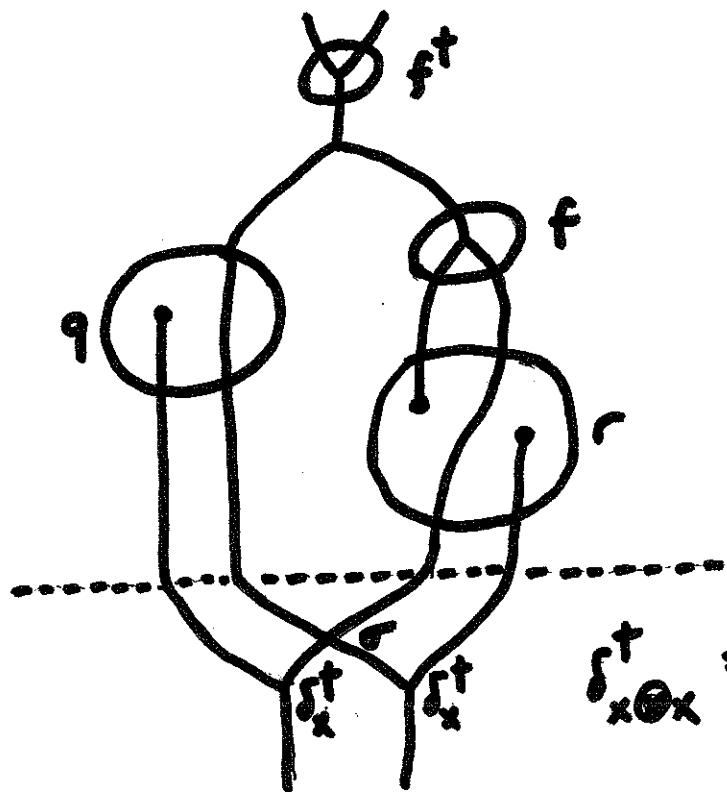
Put : $f = \delta_x : \begin{matrix} & x & \\ & / & \backslash \\ x & & x \end{matrix} \quad f^\dagger = \Upsilon$

$q = \varepsilon_x^\dagger \otimes 1_x : \begin{matrix} & & \\ & | & | \\ x & & x \end{matrix} \quad [\varepsilon_x: x \rightarrow 1 \text{ map to terminal}]$

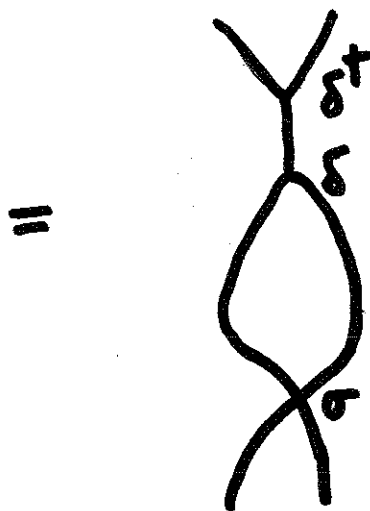
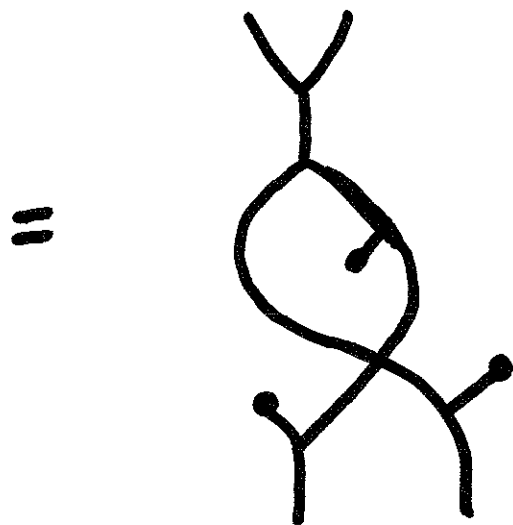
$r = \varepsilon_x \otimes 1_x \otimes \varepsilon_x^\dagger : \begin{matrix} & x & & x \\ & | & & | \\ & x & & x \end{matrix}$

LHS of FR :

(2)



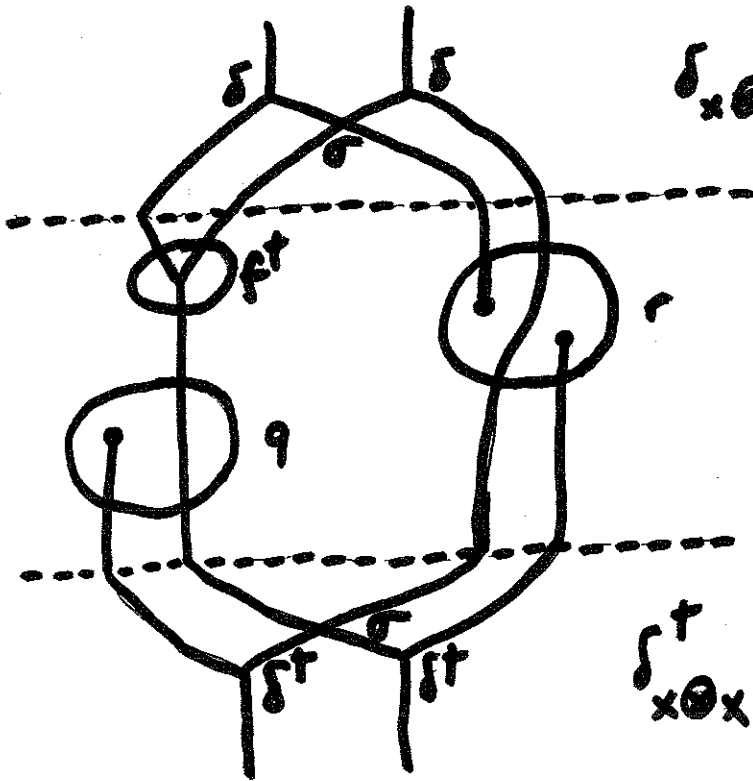
$$\sigma_{x \otimes x}^t = (\sigma_x^t \otimes \sigma_x^t) \circ (1_x \otimes \sigma \otimes 1_x)$$



$$\therefore \sigma \circ \sigma_x^t \circ \sigma_x^t$$

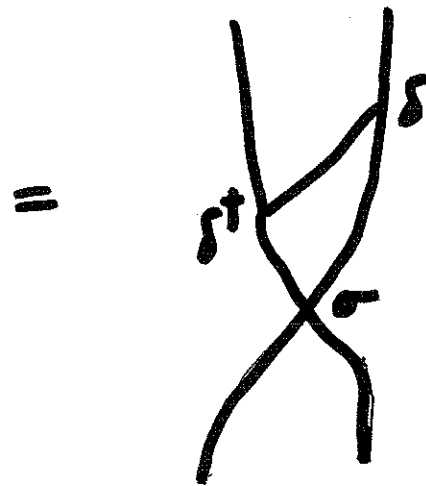
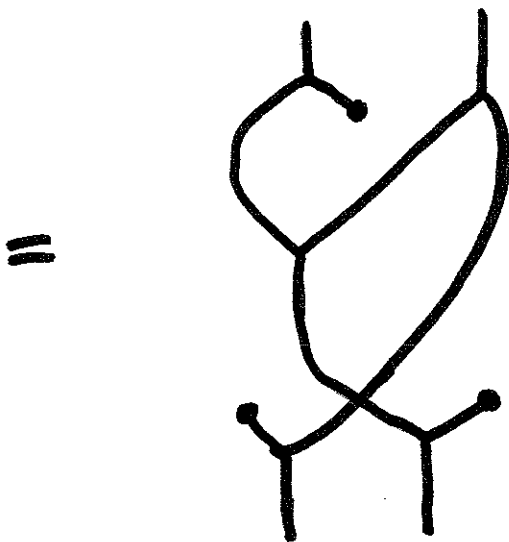
③

RHS of FR :



$$\delta_x \otimes x = (1_x \otimes \sigma \otimes 1_x) \circ (\delta_x \otimes \delta_x)$$

$$\delta_x^t \otimes x = (\delta_x^t \otimes \delta_x^t) \circ (1_x \otimes \sigma \otimes 1_x)$$



$$: \sigma \circ (\delta^t \otimes 1_x) \circ (1_x \otimes \delta)$$

$$\text{FR: } \sigma \delta \delta^t = \sigma (\delta^t \otimes 1) (1 \otimes \delta)$$

$$\Rightarrow \delta \delta^t = (\delta^t \otimes 1) (1 \otimes \delta) : \text{Frobenius law}$$

□