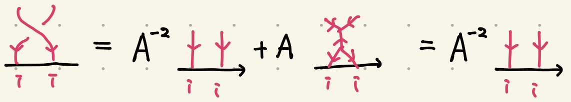
Stated and Marked Skein Algebra

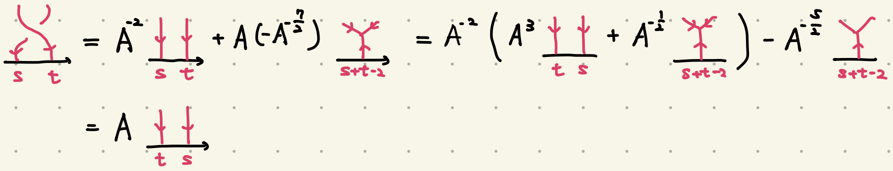
Wataru Yuasa

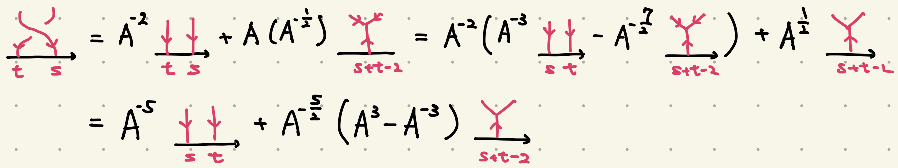
braiding for sl_3

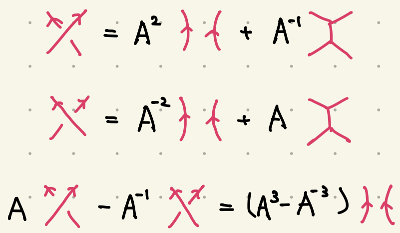
$i \in \Pi = \{1,2,3\}$



$s<t$



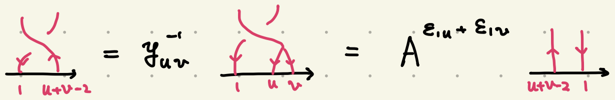


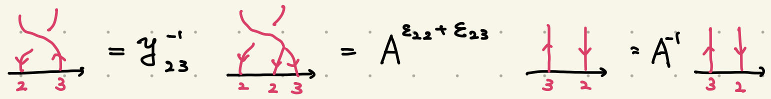


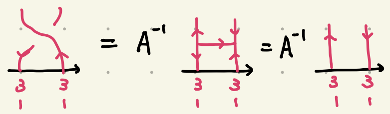
$u+v-2$	(u,v)
1	$(1,2)$
2	$(1,3)$
3	$(2,3)$

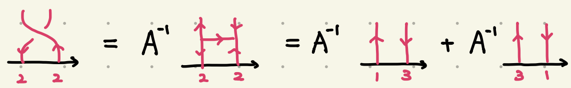
define $\quad \varepsilon_{ii} = -2$

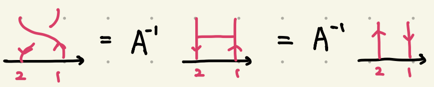
$\qquad\qquad \varepsilon_{st} = 1 \quad (s<t)$

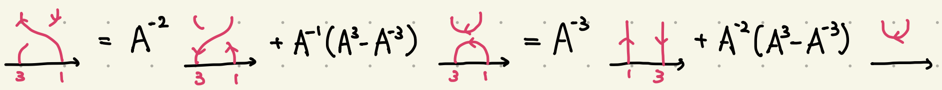


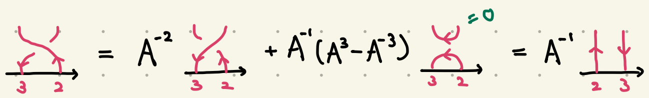




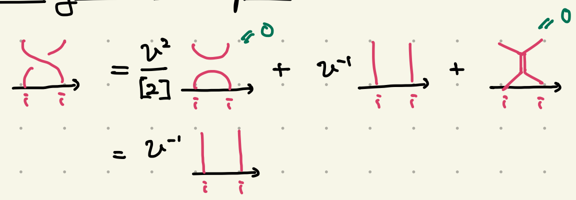


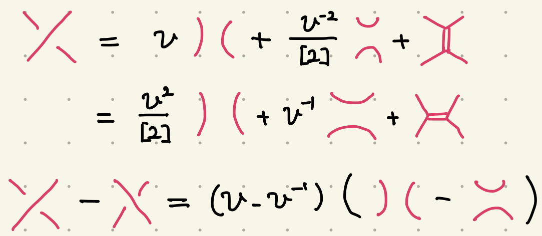




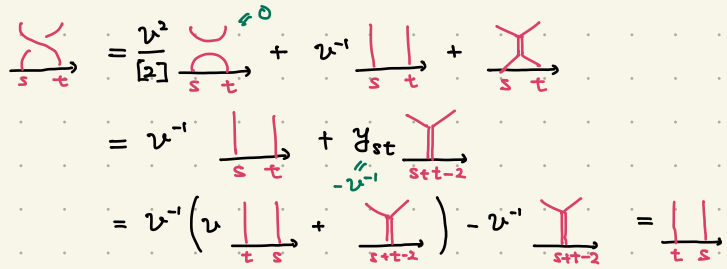


braiding for sp_4

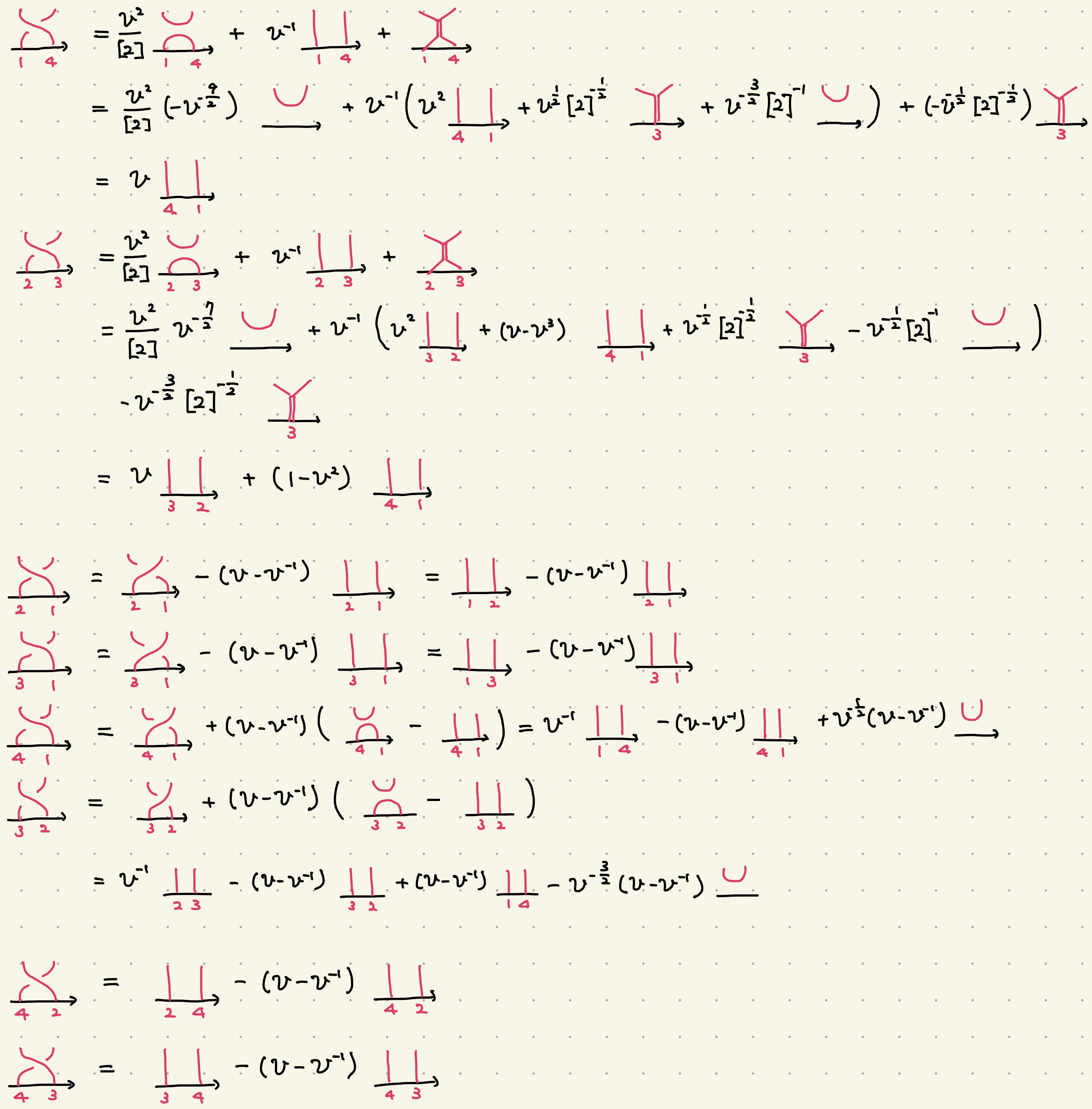




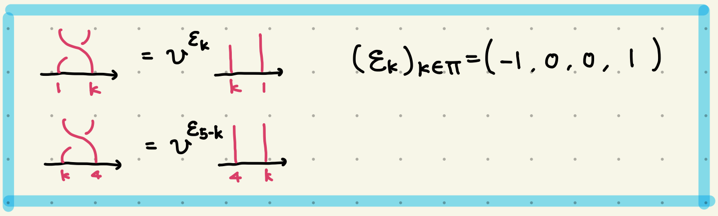
$s+t \neq 5$, $s<t$



$s+t-2$	(s,t)
1	(1,2)
2	(1,3)
3	(1,4) (2,3)
4	(2,4)
5	(3,4)

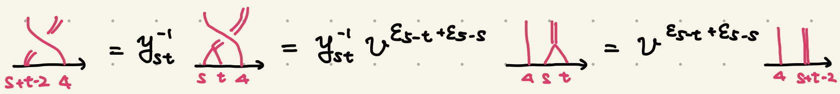


From the above.

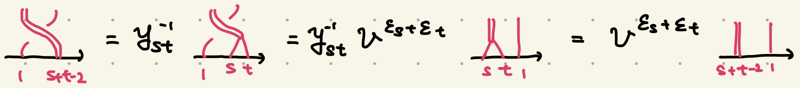


$= v^{\varepsilon_k}$ $\qquad (\varepsilon_k)_{k\in\pi} = (-1,0,0,1)$

$= v^{\varepsilon_{5-k}}$



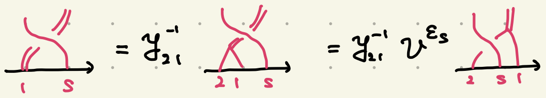
$= y_{st}^{-1} \quad = y_{st}^{-1} v^{\varepsilon_{s-t}+\varepsilon_{s-s}} \quad = v^{\varepsilon_{s-t}+\varepsilon_{s-s}}$



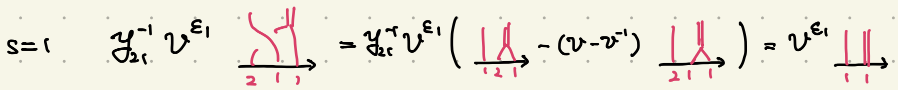
$= y_{st}^{-1} \quad = y_{st}^{-1} v^{\varepsilon_s+\varepsilon_t} \quad = v^{\varepsilon_s+\varepsilon_t}$

s+t-2	(s,t)
1	(1,2)
2	(1,3)
3	(1,4) (2,3)
4	(2,4)
5	(3,4)

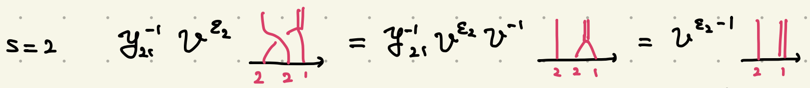
$(\eta_t) = (-1,-1,0,1,1)$



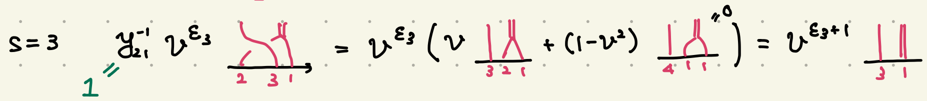
$= y_{21}^{-1} \quad = y_{21}^{-1} v^{\varepsilon_s}$



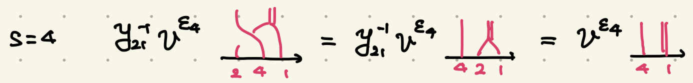
s=1 $\quad y_{21}^{-1} v^{\varepsilon_1} \quad = y_{21}^{-1} v^{\varepsilon_1}\big(\quad - (v-v^{-1}) \quad \big) = v^{\varepsilon_1}$



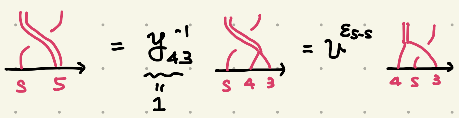
s=2 $\quad y_{21}^{-1} v^{\varepsilon_2} \quad = y_{21}^{-1} v^{\varepsilon_2} v^{-1} \quad = v^{\varepsilon_2-1}$



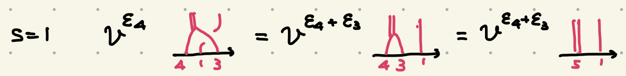
s=3 $\quad \underset{1}{\underset{\shortparallel}{y_{21}^{-1}}} v^{\varepsilon_3} \quad = v^{\varepsilon_3}\big(v \quad + (1-v^2) \overset{=0}{\quad} \big) = v^{\varepsilon_3+1}$



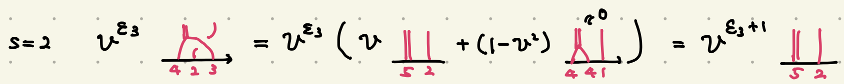
s=4 $\quad y_{21}^{-1} v^{\varepsilon_4} \quad = y_{21}^{-1} v^{\varepsilon_4} \quad = v^{\varepsilon_4}$ $\qquad \varepsilon''_s = (-1,-1,1,1)$



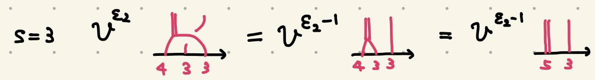
$= \underbrace{y_{43}^{-1}}_{\substack{\shortparallel \\ 1}} \quad = v^{\varepsilon_{5-s}}$



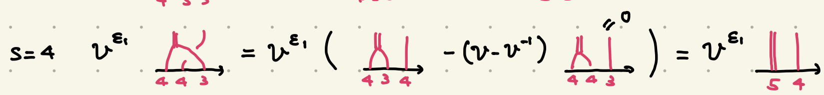
s=1 $\quad v^{\varepsilon_4} \quad = v^{\varepsilon_4+\varepsilon_3} \quad = v^{\varepsilon_4+\varepsilon_3}$



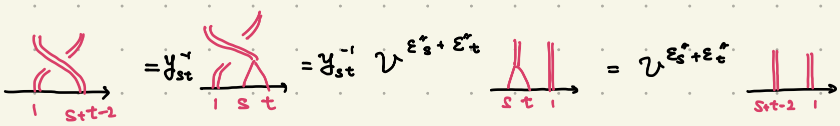
s=2 $\quad v^{\varepsilon_3} \quad = v^{\varepsilon_3}\big(v \quad + (1-v^2) \overset{=0}{\quad} \big) = v^{\varepsilon_3+1}$



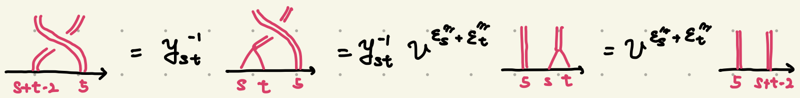
s=3 $\quad v^{\varepsilon_2} \quad = v^{\varepsilon_2-1} \quad = v^{\varepsilon_2-1}$



s=4 $\quad v^{\varepsilon_1} \quad = v^{\varepsilon_1}\big(\quad - (v-v^{-1}) \overset{=0}{\quad} \big) = v^{\varepsilon_1}$ $\qquad \varepsilon'''_s = (1,1,-1,-1)$

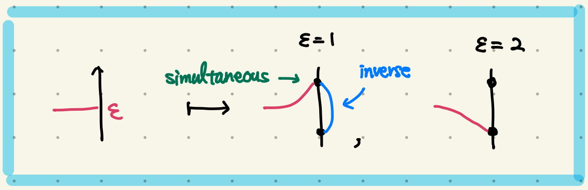


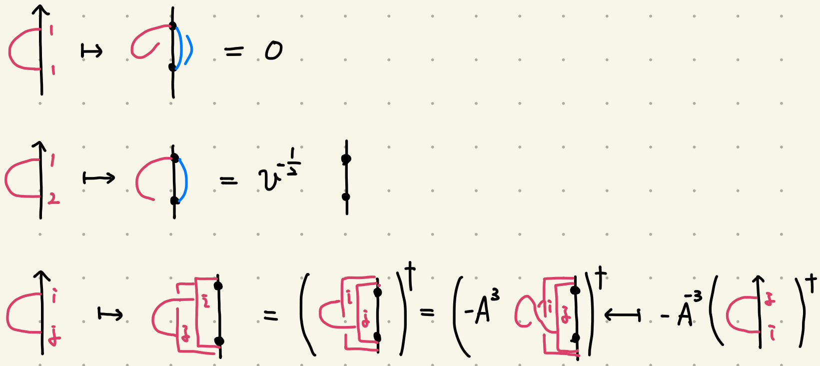
$= y_{st}^{-1} \quad = y_{st}^{-1} v^{\varepsilon''_s+\varepsilon''_t} \quad = v^{\varepsilon''_s+\varepsilon''_t} \quad \rightsquigarrow (-2,0,0,0,2)$



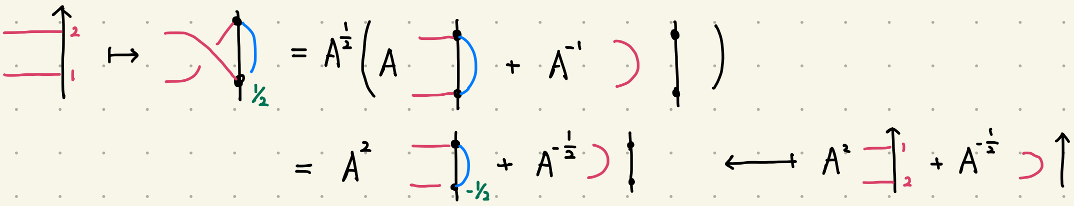
$= y_{st}^{-1} \quad = y_{st}^{-1} v^{\varepsilon'''_s+\varepsilon'''_t} \quad = v^{\varepsilon'''_s+\varepsilon'''_t} \quad \rightsquigarrow (2,0,0,0,-2)$

① well-definedness. $\mathcal{S}^{st}_{sl_2} \longrightarrow \mathcal{S}^{mk}_{sl_2}$

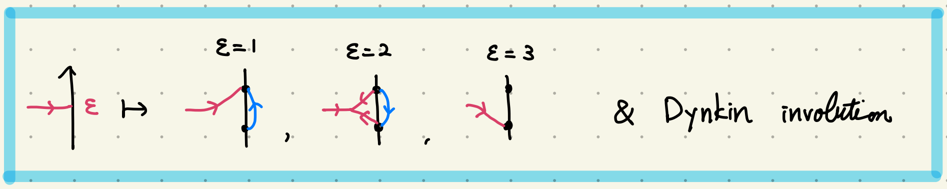


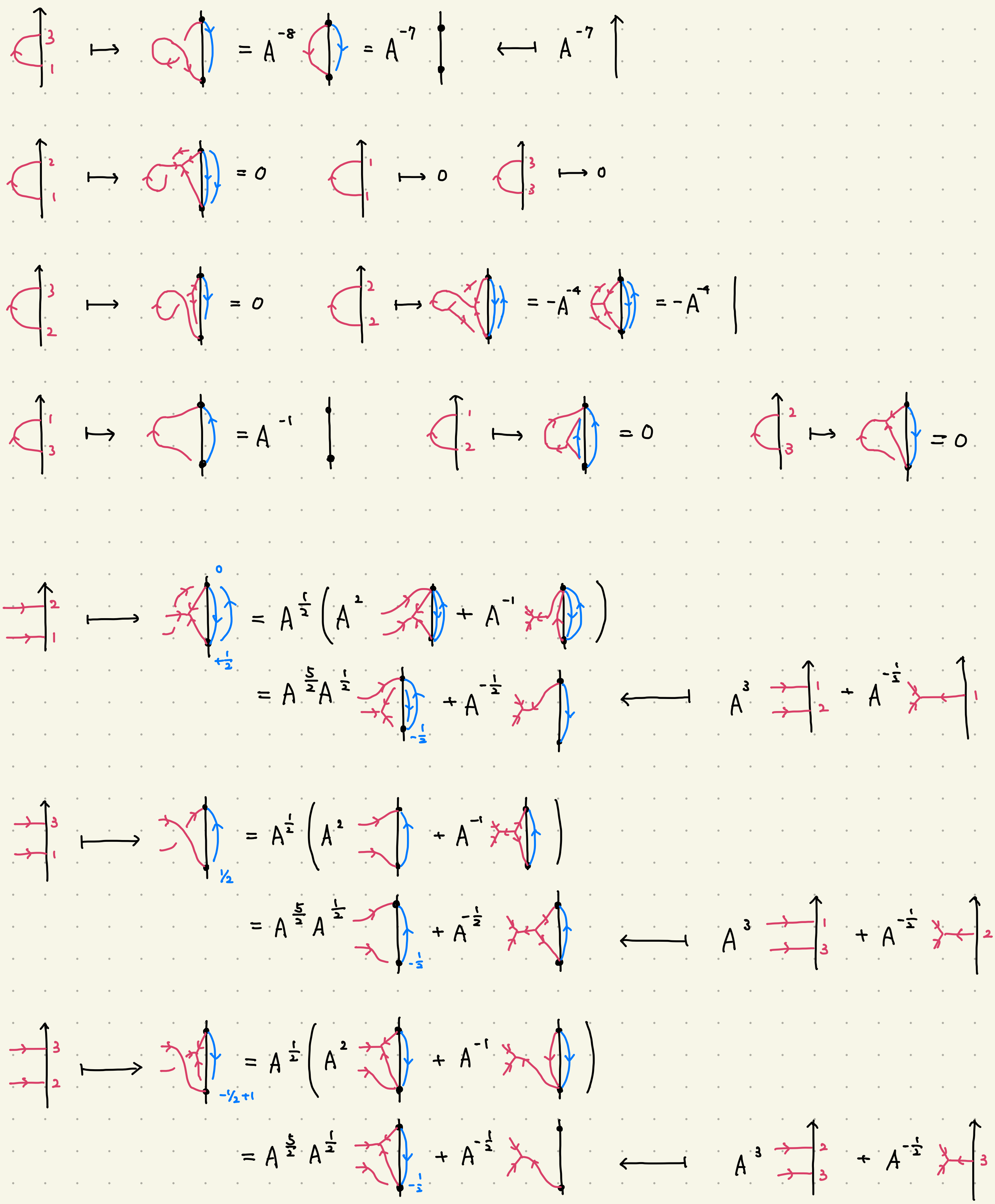


$\therefore\ x_{ji} = -A^{-3} x_{ij}^{\dagger}$

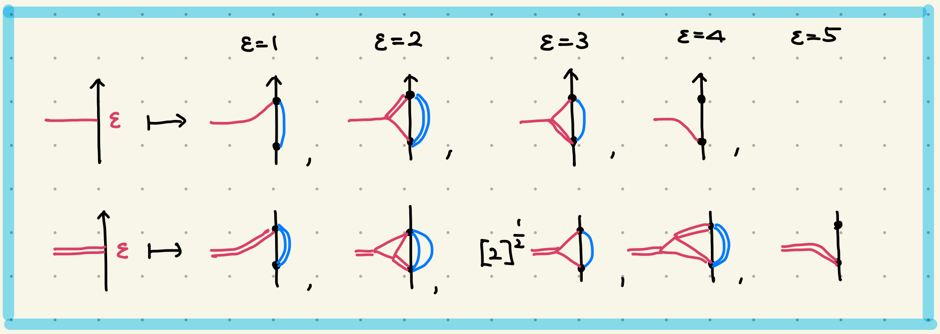


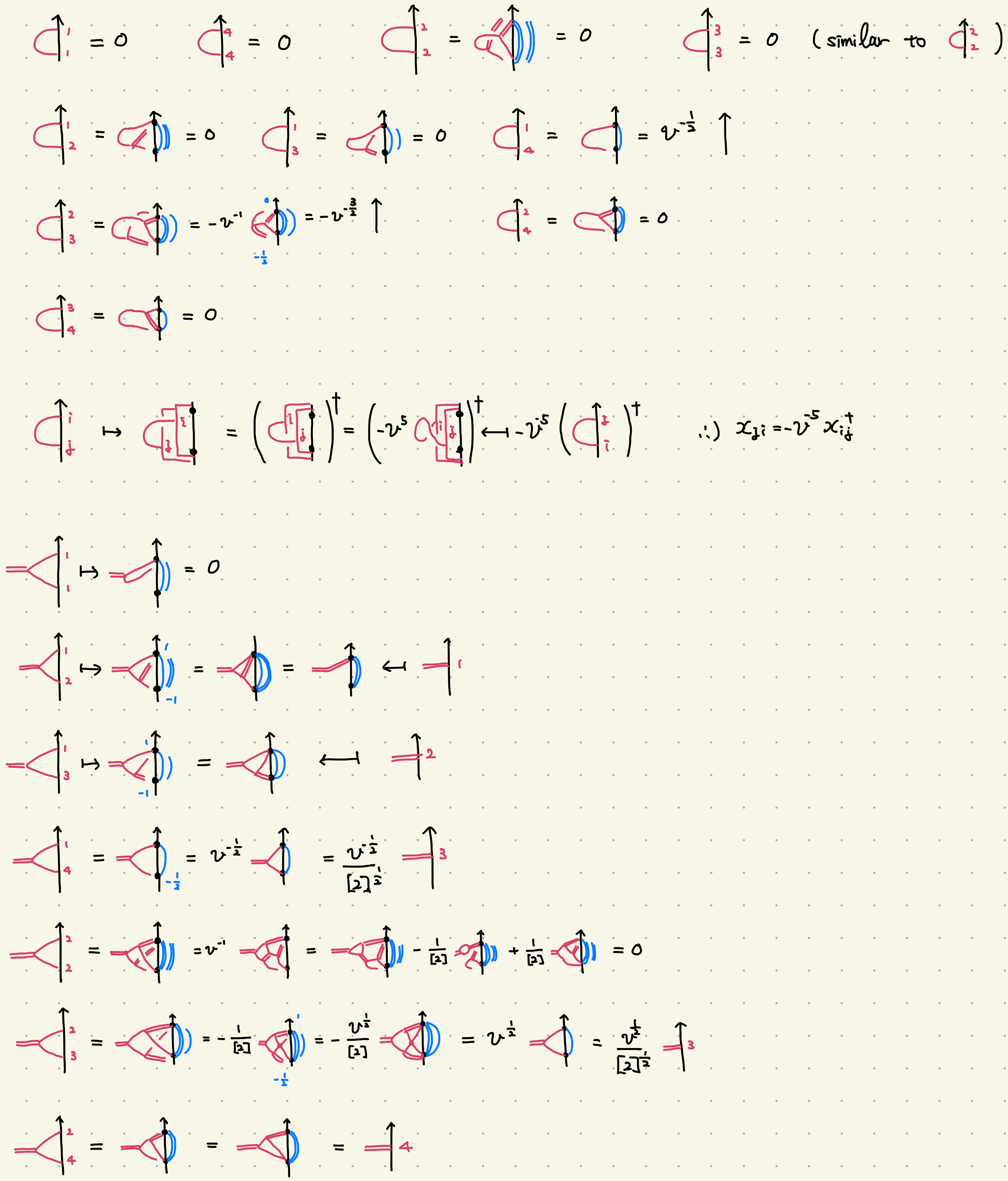
① well-definedness : $\mathcal{S}^{st}_{sl_3} \longrightarrow \mathcal{S}^{mk}_{sl_3}$

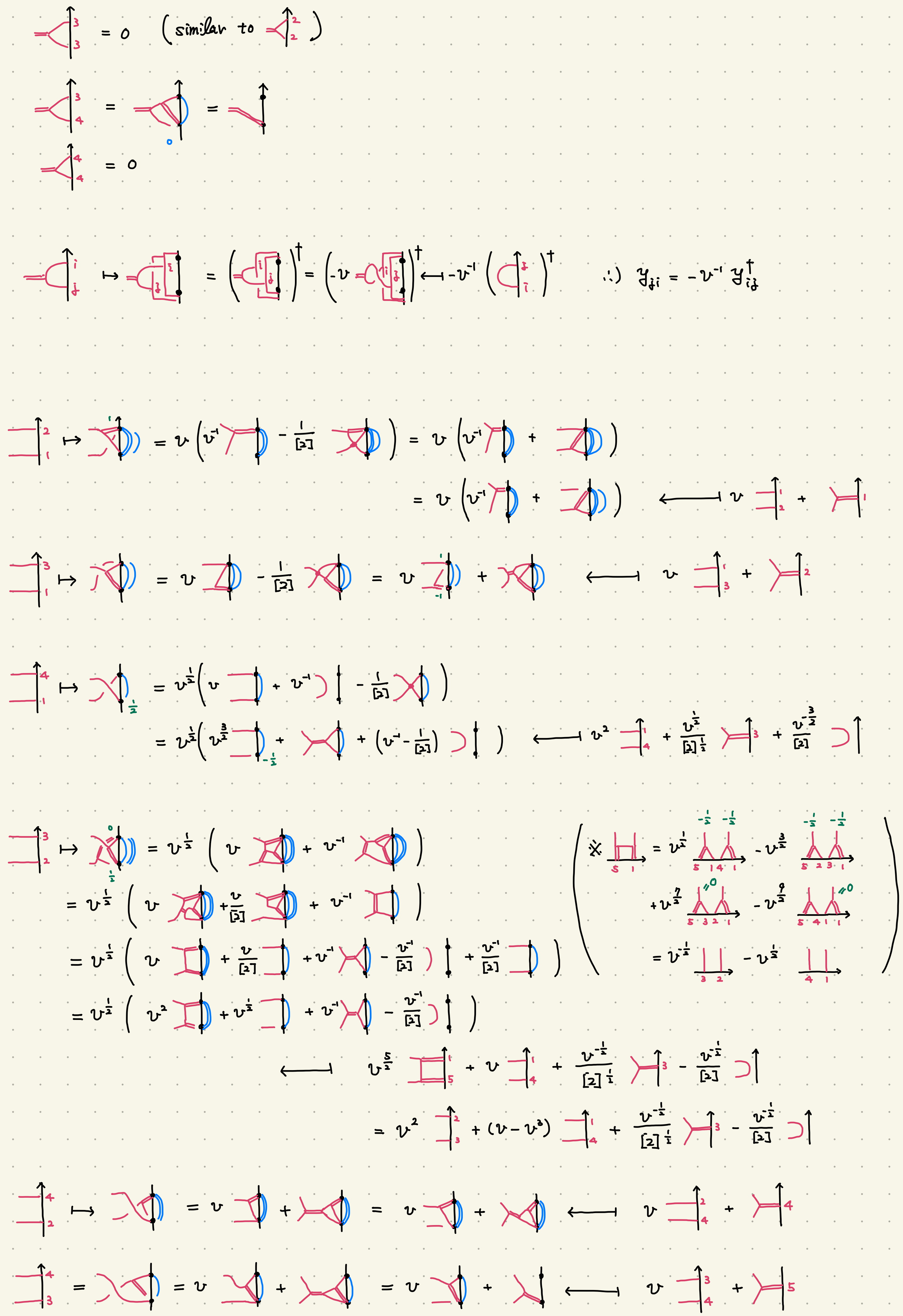




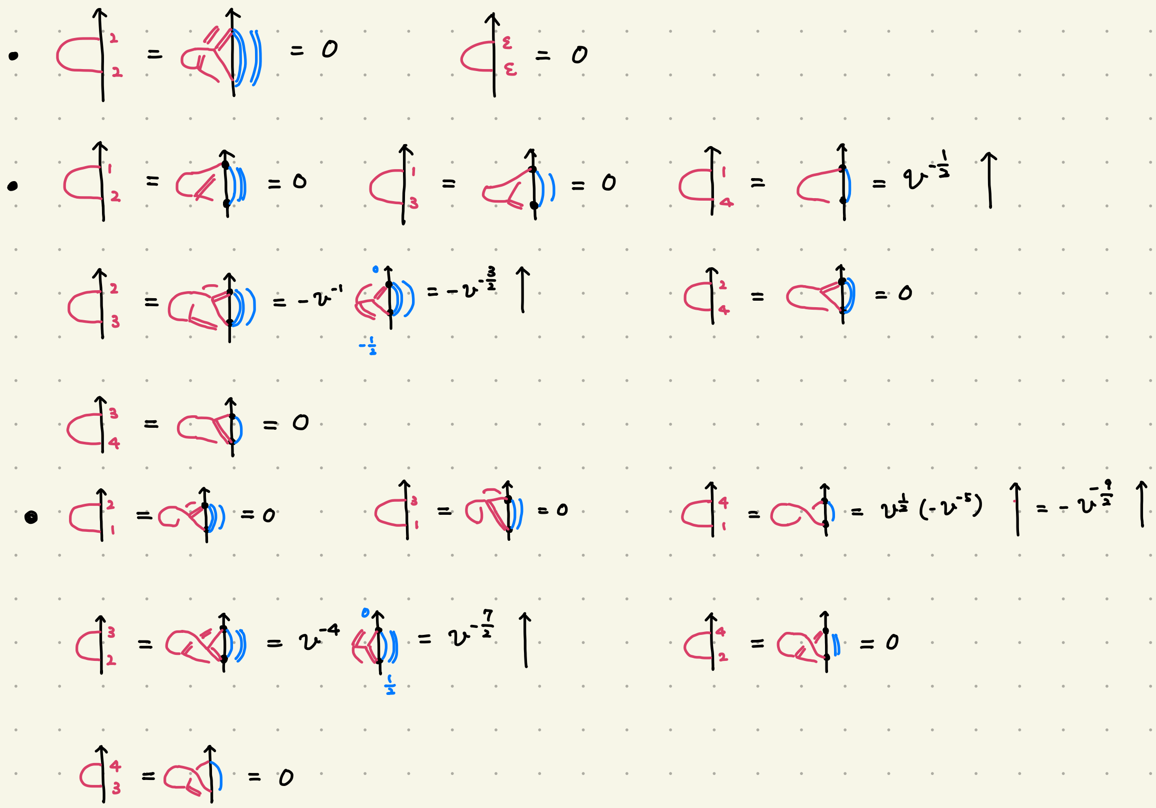
⑩ well-definedness : $\mathcal{S}^{st}_{sp_4} \longrightarrow \mathcal{S}^{mk}_{sp_4}$







(similar to
∴) $y_{ji} = -v^{-1} y_{ij}^{\dagger}$


= 0
= $v^{-\frac{1}{2}}$
= $-v^{-1}$
= $-v^{-\frac{3}{2}}$
= $v^{\frac{1}{2}}(-v^{-5})$
= $-v^{-\frac{9}{2}}$
= v^{-4}
= $v^{-\frac{7}{2}}$