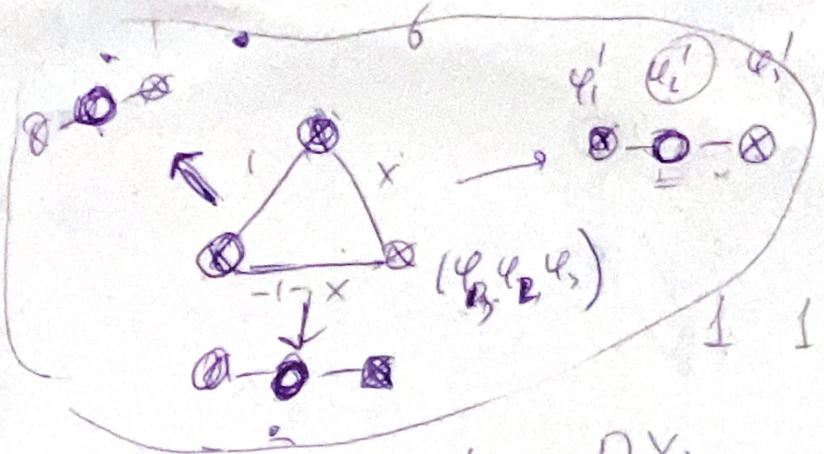
$\mathfrak{g}^{\mu}$ hom

$\Downarrow$

$\alpha(m)$

$m \in \mathcal{X}$

$q^{\alpha-\beta}\dfrac{1-q^{\alpha}x}{1-q^{\beta}x}$

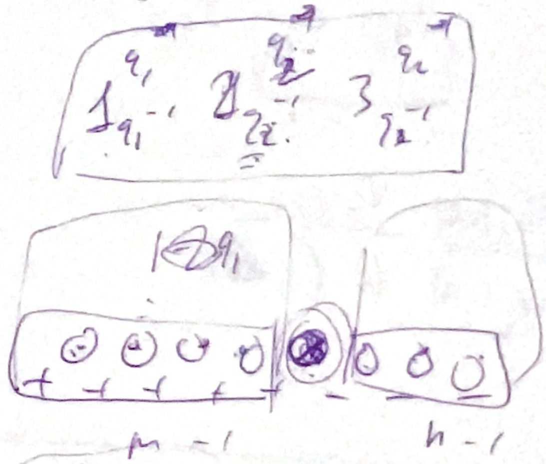


$\varphi_2' \to \prod Y_a$

Y

Necessary : $\exists$ even ones give sl_2 h.w.

Sufficient???



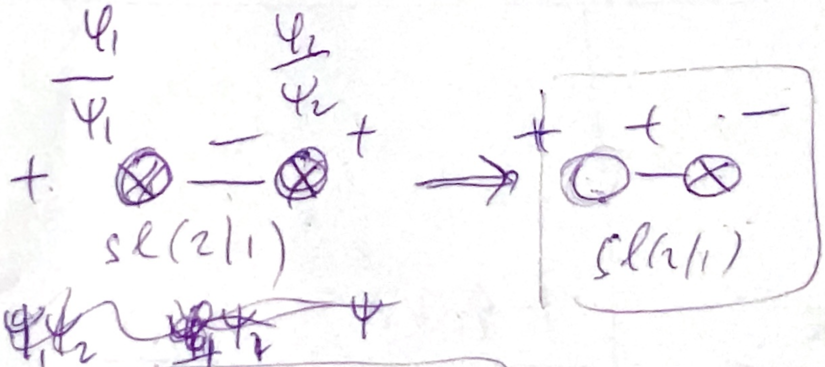
$gl(m|n)$

Ruikan Zhang ?

Malev ?

$1_{q_1^{-1}}^{q_3}\ 1_{q_3}^{q_1}$

$\dfrac{1-q^{-1}x}{1-qx}$



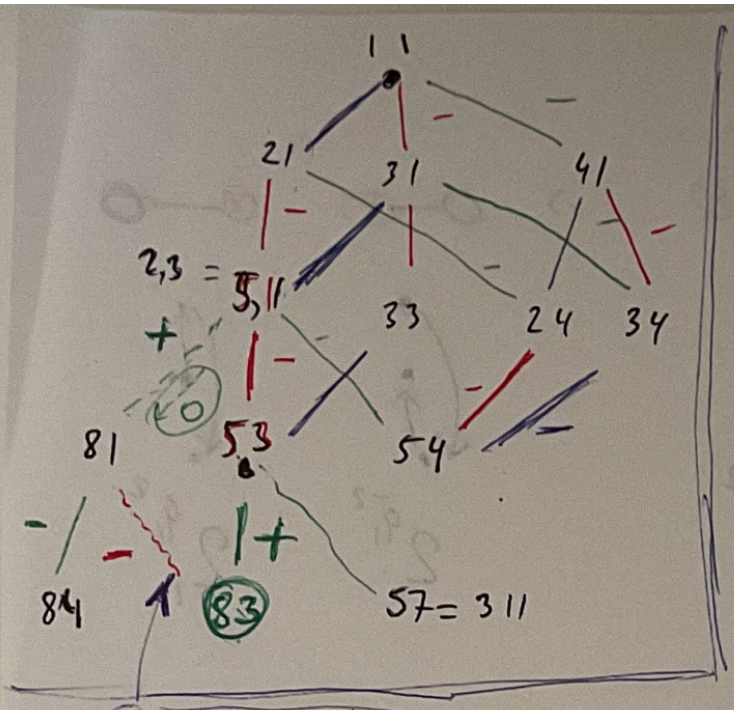
$\varphi_1\varphi_2 \quad \varphi_2\psi_1 \quad \psi_1\psi_2 \to \varphi_1\varphi_2,\ \psi_1\dfrac{\varphi_2(u+1)}{\psi_2},\ \varphi_2\psi_1\dfrac{\varphi_2(u+1)}{\varphi_2}$

$\varphi_1\varphi_2 \quad \psi_1\psi_2(u+1) \quad \psi_1\varphi_2(u+1)$

$\dfrac{\varphi_1\varphi_2}{\psi_1\psi_2(u+1)} = \dfrac{g(x+1)}{g(x)}$

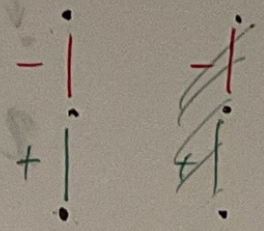
$\dfrac{(1-q_1x)(1-q_2x)}{(1-q_1^{-1}x)(1-q_2^{-1}x)}$

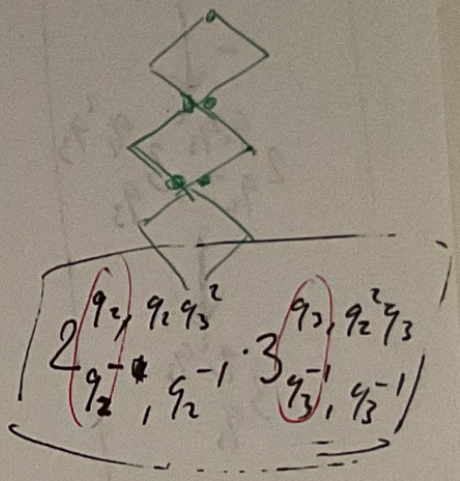
q_3^{-1}



323 is OK.

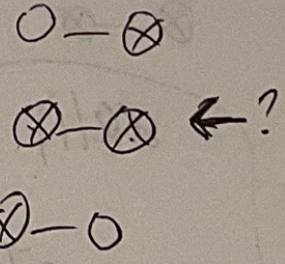
Question: How to expand in general?!

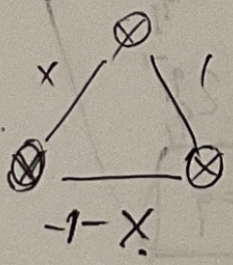




9×4

expand up for some reason?





$E_i(z),\ F_i(z)$

$F_i(z)E_i(w) + E_i(w)E_i(z) = 0$, $(E_i(x), F_i(w)) = \frac{\delta\psi^+ + \delta\psi^-}{}$

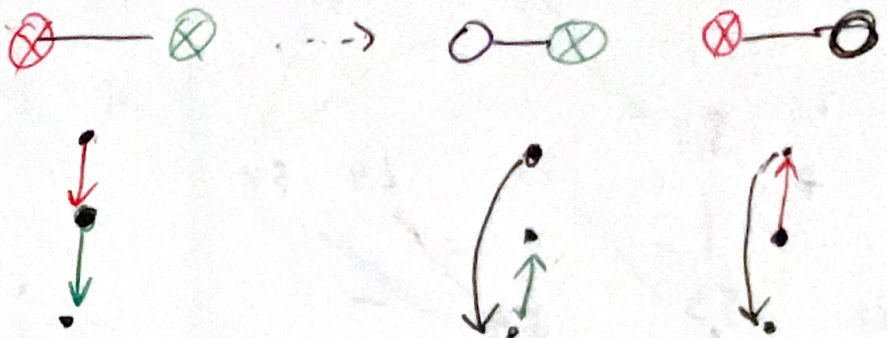
$(\ \ )E_i(z)E_{i+1}(w) + (\ \ )E_{i+1}(w)E_i(z) = 0$

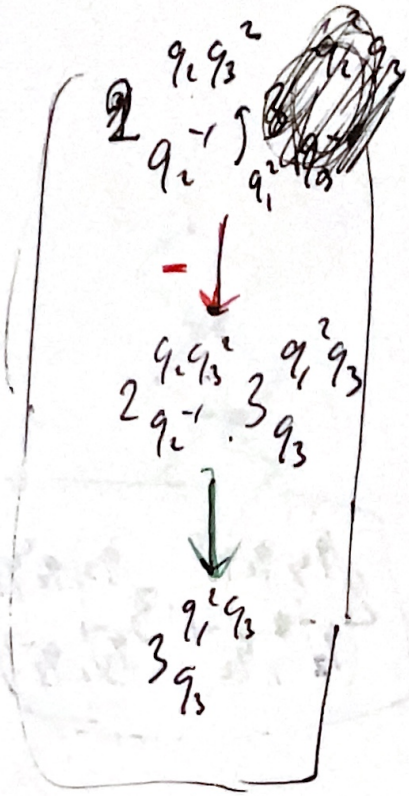
↑ linear. + Serre ↓

$(\ \ )\psi_i(z)E_j(w) = (\ \ )E_j(w)\psi_i(z)$

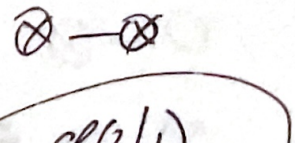
Compare to $sl(2|1)$?

$1^{q_1}_{q_1^{-1}}\ 2^{q_2}_{q_2^{-1}}$ 4 d.





$2^{q_1^{-2}}_{1}$ $2^{q_1^{-2}}_{1}$ $2^{q_1^{2}}_{1}$



$sl(2|1)$

$A_2 = 3^{q_1^{-1}}_{q_1}$

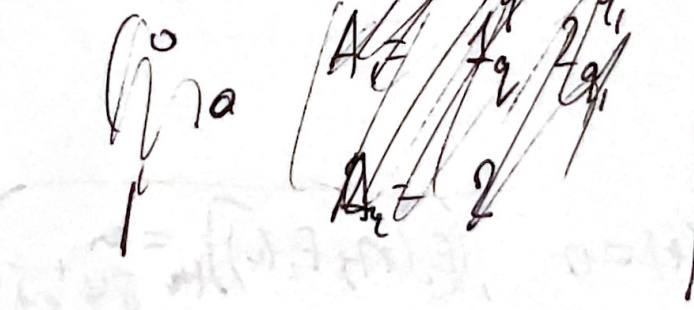
$A_3 = 2^{q_1^{-1}}_{q_1}$

$2,3$ in $D(2,1,\alpha)$

$A_2 = 3^{q_1^{-1}}_{q_1}$

$A_3 = 2^{q_1^{-1}}_{q_1}$

$q_1 = q$



$Y = 2^{q^{-1}}_{q^{\alpha}}$ $\frac{1-q^{-1}q^{\alpha/2}}{1-q^{\alpha}(z)}$

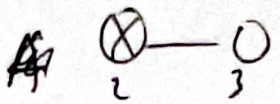
$\begin{pmatrix} 2 & -1 \\ -1 & 0 \end{pmatrix}$ $\alpha_1 - \alpha_2$

+ + −

$A_2 = 2^{q_1^{-2}}_{q_1^{+2}} 3^{q_1}_{q_1^{-1}}$

$A_3 = 2^{q_1^{\alpha}}_{q_1^{-1}}$

$2^{q_1^{-1}}_{q_1} \xrightarrow{A^{-1}_{2,q_1}} 2^{q_1^{3}}_{q_1} 3^{1}_{q_1^{2}} \xrightarrow{A^{-1}_{3,q_1^2}} 3^{1}_{q_1^{2}}$



$A_2 = 3^{q_1}_{q_1^{-1}}$

$A_3 = 3^{q_1^{-2}\ q_1}_{q_1^2\ q_1^{-1}}$

$2^{q_1^2}_1 \xrightarrow[A_{2,q_1}^{-1}]{} 2^{q_1^2}_1 3^{q_1^{-1}}_{q_1} \xrightarrow[A_{3,q_1}^{-1}]{} 2\ 3^{q_1^3}_{q_1}$

Kang sane ?

$2^{q_2}_{q_2^{-1}}\ 3^{q_3}_{q_3^{-1}}$

$2^{q_2^2}_1\ 3^{q_1^{-1}}_{q_2 q_3^{-1}}$

$2^{q_1}_1\ 3^{q_1^{-1}}_{a q_1}$

$2^{a}_1\ 3^{q_1}_{a q_1}$

$3^{q}_1 \rightarrow 2^{q_1^{-1}}_{q_1} 3^{a} \rightarrow 2^{q_1^3}_{q_1} 3^{q}_{q_1^2} \rightarrow 3^{0}_{q_1^2}$

Kang.

the same..

? $2^{q_1^{-1}}_1$

5 dim

8 dim

12 typical