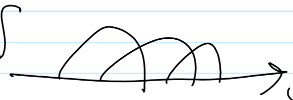
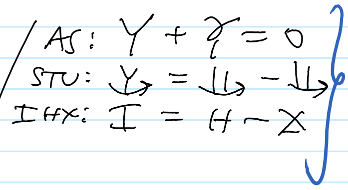
Monday-7 AKT on 140224: $\mathcal A$ is an algebra; Lie algebraic weight systems

February-22-14 11:58 AM

HW4 returned! HW5 due!

$\mathcal{A} = \{$  $\} / 4T \cong \{$  $\} /$ 

on board

Proposition $\mathcal{A}(\uparrow) = \mathcal{A}(\bigcirc)$ is a graded commutative algebra.

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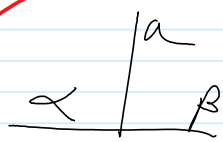
1. Review Lie algs.
2. The low algebra statement: 

$W_{\mathfrak{g},R}$: f_{abc} t^{ab} $R(X_a)\cdot e_\alpha = r^\beta_{a\alpha} e_\beta$

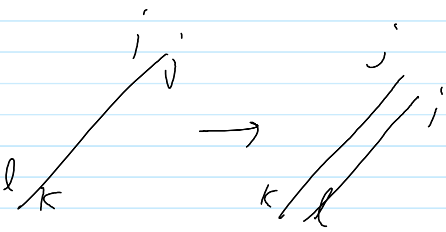
done line

3. The gl_N calculation $a \Leftrightarrow (ij)$

$X_{ij} = i \begin{pmatrix} & j & \end{pmatrix}$ $\qquad X_{ij}X_{kl} = \delta_{jk}X_{il}$

$[X_{ij}, X_{kl}] = \delta_{jk}X_{il} - \delta_{il}X_{kj}$

$t_{(ij)(kl)} = tr\, X_{ij}X_{kl} = \delta_{jk}\delta_{il}$

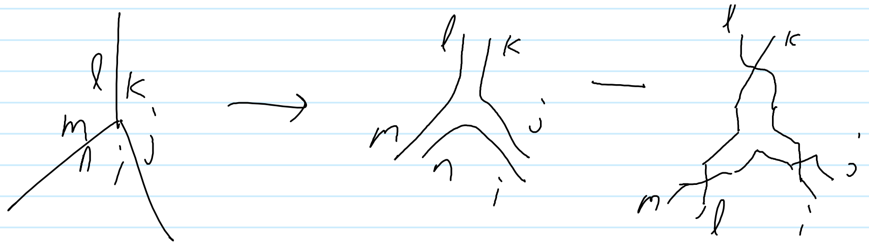


$t^{(ij)(kl)} =$ same; indeed

$t_{ij,kl}\, t^{kl,mn} = \sum_{k,l} \delta_{jk}\delta_{il}\delta^{kn}\delta^{lm} = \delta_{jn}\delta_{im}$

$F_{ij,kl,mn} = \langle [X_{ij}, X_{kl}], X_{mn} \rangle = \langle \delta_{jk}X_{il} - \delta_{il}X_{kj}, X_{mn} \rangle$

$= \delta_{jk}\delta_{lm}\delta_{in} - \delta_{il}\delta_{jm}\delta_{kn}$



$$r^{l}_{(ij)k} = \delta_{jk}\,\delta_{i}^{l}$$